Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

S
9
霱
€
'n
ñ
Ħ

27	26	25	24	2.5	2 6	) k	2 6	) L	1 18	17	10	1.5	14	1 L	12	1 1	10	,	o 00	7	١σ	· U	4.1	· L	· K		NO.	Kesult	,
45.2	45.4	٠	٠	40.0	4		4.0	٠.	46.2				46.6	4	47	4.7	47.8	47.8	47.8	47.8	47.8					53.8	score	1	
3.1	3.1	3.1	3.1	 	٠. ۱	) L	ر م د	، د د	 	3.1	٠	٠	ω 		•				٠	٠		ω. ω			3.6	3.6	Match		dФ
1858	882	2345	2345	1813	748	748	u/0	4/80	4765	2296	2447	1386	1386	2852	536	536	958	958	958	958	958	1824	1824	1641	3777	3777	Length		
Ν	N	4	ω	U	<u> </u>	-	٠.	·	ω	4	2	w	N	ω	N	من	4	4	ω	ω	N	4	ω	Н	4	ω	DB.		
US-08-909-965C-11	US-08-909-965C-9	US-09-300-985-1	US-08-955-937A-1	T-US94-12883-	8-484	-08-361-467B-	-08-946-026-2	-08-936-135	-08-936-135-2	US-08-496-841C-137	US-09-014-969-14	-09-252-329-	-897-340-	US-09-027-137-2	US-08-911-020-1			-716-	US-09-135-988-5	US-09-447-208-5	US-08-757-046A-5	US-09-616-990-1	US-08-606-505B-1	US-08-300-903A-8		US-09-121-321-15	ID		
11.	9	e L	μ,	ω	ω,	3,	23,	23,	(D)	137,	14	1,	Sequence 1, Appli	2	е 1		<b>σ</b>	ر ا	5	<u>ن</u>	J.	1	μ,	8	Sequence 15, Appl	•	Description		

4.5	44	43	42	4-	40	. 39	) &	37	30	, <u>u</u>	یں د 4ء 1	) (L	) (L)	) (4 ) (-	3 2	. 29	28
44 U	4.5	4.5	45	45	4-5	45	4.5	4.5	4	4.0	4.0	4.5	4.0	4.0	4 0	4.5	45
3.1	ω - 1	ω -	3.1	3 1	ω . μ	3.1	3.1	ω - 1	ω. -	3.1			ω. . μ	٠. ـ	ω. - Ε		3.1
1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	T8/T	1781	1781	1781
w	w	w	w	N	Ν	N	2	N	Н	_	μ	بر	ب	۳	ب	ب	ب
US-08-296-749-2	US-08-475-680-2	US-08-863-790-2	US-08-714-017-2	US-08-720-420A-2	US-08-483-932-2	US-08-473-503-2	US-08-487-595-4	US-08-487-113D-2	US-08-483-389-2	US-08-485-604-4	US-08-482-882-2	US-08-656-984A-4	US-08-481-130-4	US-08-245-295-4	US-08-433-010-2	US-08-314-362-2	US-08-314-615-2
Sequence 2, Appli	2,	N	2	Sequence 2, Appli	ν,	N	•	2	N	Sequence 4, Appli	Sequence 2, Appli	Sequence 4, Appli	Sequence 4, Appli	Sequence 4, Appli	Sequence 2, Appli	•	Sequence 2, Appli

## ALIGNMENTS

]	, , , , , , , , , , , , , , , , , , ,
E H	RESULT US-09- ; Sequ ; Pate ; GEN A ; A
	RESULT 1 US-09-121-321-15 Sequence 15, A Patent No. 609 GENERAL INFOR GENERAL INFOR APPLICANT: APPLICANT:
APPLICANT: APPLICANT: TITLE OF IN TITLE OF IN TITLE OF IN NUMBER OF S CORRESPONDE STATE: NE STATE: NE COUNTRY: COUNTRY: COMPUTER: NE COUNTER: NE COMPUTER: NE MEDIUM TY COMPUTER: NE TILING DA CLASSIFICATIO FILING DA TELEPHONE TELEPHONE TELEPHONE TELEPHONE TELEPHONE TELEPHONE TELEPHONE TELEFAX: TOPOLOGY: NAME/KEY: NAME/KEY: LOCATION:	T 1 -121-321-1 uence 15, ent No. 60 NERAL INFO APPLICANT: APPLICANT:
APPLICANT: Okumu APPLICANT: Sakagu TITLE OF INVENTIO) TITLE OF INVENTIO TITLE OF INVENTIO TITLE OF INVENTIO TITLE OF INVENTIO NUMBER OF SEQUENCI CORRESPONDENCE ADD ADDRESSEE: FISH STREET: 1251 AN CITY: New York COUNTRY: USA ZIP: 10020 COMPUTER READABLE MEDIUM TYPE: PI COMPUTER: IBM FOR OPERATING SYSTEM OPERATING SYSTEM OPERATION NUME FILING DATE: 13 CURSENT APPLICATION APPLICATION NUME FILING DATE: 13 ATTORNEY/AGENT INF NAME: Haley, Ja REGISTRATION NUME FILING DATE: 19 ATTORNEY/AGENT INF NAME: Haley, Ja REGISTRATION TELEPHONE: 212-59 FORMATION FOR SEQ SEQUENCE CHARACTER LENGTH: 3777 bas SEQUENCE CHARACTER LOCATION: 139	ULT 1 09-121-15 equence 15, Applicat atent No. 6090783 GENERAL INFORMATION: APPLICANT: Saiga, APPLICANT: Unita, APPLICANT: Igaras
PI OKUMUTA PI SAKAGUA PI SE: FISH PI	-15 , Applicat , Applicat 6090783 FORMATION: FT: Saiga, TT: Orita, TT: Igaras
APPLICANT: Okumura, KA APPLICANT: Sakaguchi, TITLE OF INVENTION: DA TITLE OF INVENTION: GE NUMBER OF SEQUENCES: CORRESPONDENCE ADDRESS: CORRESPONDENCE ADDRESS: ADDRESSEE: FISH & NE STATE: New York COUNTRY: USA ZIP: 10020 COMPUTER READABLE FORM: MEDIUM TYPE: FIOPDY COMPUTER: IBM PC COMPUTER: IBM	plication 783 ATION: Saiga, Ak Orita, Sa Igarashi,
APPLICANT: Okumura, Koulchi APPLICANT: Sakaguchi, Gak, TITLE OF INVENTION: DNA MC TITLE OF INVENTION: GENE E NUMBER OF SEQUENCES: 20 CORRESPONDENCE ADDRESS: ADDRESSEE: FISH & NEAVE STREET: 1251 Avenue of t CITY: New York COUNTRY: USA ZIP: 10020 COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk COMPUTER: LBM PC compati OPERATING SYSTEM: PC-DOS SOFTWARE: PATENTION DATA: APPLICATION NUMBER: US/O FILING DATE: CLASSIFICATION: PRIOR APPLICATION DATA: APPLICATION UMBER: US/O FILING DATE: 19-SEP-1997 ATTORNEY/AGENT INFORMATION: NAME: Haley, James F. REGISTRATION UMBER: 27, REFERENCE/DOCKET NUMBER: 27, REFERENCE/DOCKET NUMBER: TELECOMMUNICATION INFORMATION: NAME: Haley, James F. REGISTRATION UMBER: 27, REFERENCE/DOCKET NUMBER: TELECOMMUNICATION INFORMATION: NAME: TELEFORMS: 212-596-9000 TELEFAX: 212-596-9000 TELEFAX: 212-596-9000 TELEFAX: 212-596-9000 INFORMATION FOR SEQ ID NO: 1 SEQUENCE CHARACTERISTICS: LENGTH: 3777 base pairs TYPE: nucleic acid STRANDEDNESS: double TOPOLOGY: linear MOLECULE TYPE: CDN NAME/KEY: CDS LOCATION: 1392151	lon US/0 Akihiko Satoshi
NEWDURARY ROUICHI SMANUCHI SMANUCHI SMANUCH SMANUCH SMANUCH SMANUCH SMANUCH SMANUCH SE ADDRESS: 20 2E ADDRESS: 20 2FISH & NEAVE 251 Avenue of the YORK 15A 35A 35A 35A 36B 36B 37 DATA: 11ON: 21 OATA: 11ON: 21 OATA: 11ON: 21 OATA: 11ON: 21 OATA: 27 794 0CKET NUMBER: 27 794 0CKET NUMBER: 27 1058 pairs 61 Gouble 11near 21 CDNA 31392151	US/09121 ihiko toshi Hisanaga
	5 Application US/09121321 190783 RMATION: Saiga, Akihiko Orita, Satoshi Igarashi, Hisanaga
KOULCHI KOULENI KOULE RELA DNA MOLECULE RELA GENE EXPRESSION A 20 20 20 30 31 81 81 82 84 85 86 87 87 87 87 87 87 87 87 87 87 87 97 87 105 88 933,803 9-1997 87 87 87 105 88 92 97 87 87 105 88 92 97 87 97 97 97 97 97 97 97 97 97 97 97 97 97	321
RELATING FOR AND N 1121 121 2CIP	
LATING AND NO Version	
TO OVEI	
EL PRO	
SUPPRESSION . PROTEIN	
NOOIS	
O <sub>rg</sub>	

```
US-08-933-803A-15
; Sequence 15, Application US/08933803A
; Patent No. 6218522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
Ωy
                            밁
                                                                                                                                                      US-08-933-803A-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                             Query Match
Best Local Similarity 83.6%;
                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:
NAME: Haley, James F.
REGISTRATION NUMBER: 27,794
REFERENCE/DOCKET NUMBER: SHGN
TELECOMMUNICATION INFORMATION:
TELEPHONE: 212-596-9000
                                                                                                                                                                                                                                                                              TELEFAX: 212-596-9090
INFORMATION FOR SEQ ID NO: 15:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Saiga, Akihiko
APPLICANT: Orita, Satoshi
APPLICANT: Igarashi, Hisanaga
APPLICANT: Okumura, Kouichi
APPLICANT: Sakaguchi, Gaku
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3761 AAAAAAAAAAAA 3773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1462 aaaaaaaaaaaaa 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION: CHE EXPRESSION AND NOVEL PROTEIN
                          1462 aaaaaaaaaaaaa 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NUMBER OF
                                                                                                                                                                                                FEATURE:
                                                                                                                                                                                                             MOLECULE TYPE: cDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3.6%;
Local Similarity 83.6%;
les 61; Conservation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COUNTRY:
                                                                                                                                                                                                                                                                                              CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US/08/933,803A FILING DATE: 19-SEP-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADDRESSEE:
                                                                                                                                                                    NAME/KEY: CDS
LOCATION: 139
                                                                                                                                                                                                                                        STRANDEDNESS:
                                                                                                                                                                                                                                                        TYPE:
                                                                                                                                                                                                                            TOPOLOGY:
                                                                                                                                                                                                                                                                    LENGTH:
                                                                                    61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                New York
                                                                                                                                                                                                                                                     nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1251 Avenue of the Americas
                                                                                                                                                                                                                                                                  3777 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    USA
                                                                                    Conservative
                                                                                                                                                                                                                            linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FISH & NEAVE
                                                                                                                                                                                                                                         double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                     0;
                                                                                  Score 53.8; DB 4;
Pred. No. 2e-05;
Pred. No. 2e-15;
                                                                                                                                                                                                                                                                                                                                                       SHGN-12CIP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 53.8; DB 3; Length 3777; Pred. No. 2e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                              DB 4; Length 3777;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                        Gaps
                                                                                        0;
```

```
US-08-300-903A-8
                                                                 В
                                                                                                                                                                                                                    US-08-300-903A-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 8, Application US/08300903A Patent No. 5591630
                                                                                                                                               Query Match 3.4%;
Best Local Similarity 71.0%;
                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX: 206-233-0644
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3761 AAAAAAAAAAAAA 3773
              1442 aaaaaaaaaaaaaaaaaaaaaaaaaaaa 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRIOR APPLICATION DATA:
APPLICATION NUMBER: USSN 08/236,919
FILING DATE: 06-MAY-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER: Apple Macintosh
OPERATING SYSTEM: Apple Operating System 7.1
SOCTWARE: Microsoft Word for Apple, Version :
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NUMBER OF SEQUENCES: 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: Anderson, Dirk M APPLICANT: Giri, Judith G
                                                                                     1382 tttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcgggcaaaaa 1441
                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE CHARACTERISTICS:
LENGTH: 1641 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELECOMMUNICATION INFORMATION: TELEPHONE: 206-587-0430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
                                                              1499 TTTGTATTTTGACATTGTACCTTGTATAAACAAATAAAACATCTATTTTCAATAAAAA 1558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STREET: Seattle
1559 AAAAAAAAAAAAAAAAAAAAAAAAAAAA 1591
                                                                                                                                                                                                                                                                    FEATURE:
                                                                                                                                                                                                                                                                                      ANTI-SENSE:
                                                                                                                                                                                                                                                                                                    HYPOTHETICAL:
                                                                                                                                                                                                                                                                                                                  MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: US/08/300, FILING DATE: 06-SEPTEMBER-1994 CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REGISTRATION NUMBER: 34. REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                      TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                  LOCATION:
                                                                                                                                                                                                                                                    NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                    STRANDEDNESS:
                                                                                                                                   66;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             98101
                                                                                                                                                                                                                                                                                                                                                                    nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Perkins, Patricia Anne
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             51 University Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           USA
                                                                                                                                                                                                                                                                                                                                                                                                                                       206-233-0644
                                                                                                                                 Conservative
                                                                                                                                                                                                                                 CDS
3..839
                                                                                                                                                                                                                                                                                      NO
                                                                                                                                                                                                                                                                                                                                       linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Immunex Corporation
                                                                                                                                                                                                                                                                                                      NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Floppy disk
                                                                                                                                                                                                                                                                                                                                                    single
                                                                                                                                                                                                                                                                                                                       CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            us/08/300,903A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34,695
                                                                                                                                                                                                                                                                                                                                                                                                                         8:

 Mismatches

                                                                                                                                   Score 49.8; DB 1; Length 1641; Pred. No. 0.00017; 0; Mismatches 27; Indels 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2822-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Version 5.la
                                                                                                                                      0;
                                                                                                                                      Gaps
```

; Sequence 1, Application US/08605505B ; Patent No. 6114601 ; GENERAL INFORMATION:

US-08-606-505B-1

0;

```
US-09-616-990-1
; Sequence 1, Application US/09616990
; Patent No. 6232109
; GENERAL INFORMATION:
                                                                                                                                           밁
                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                 밁
                                                                                              RESULT
                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                          US-08-606-505B-1
                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                         Query Match 3.3%;
Best Local Similarity 60.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELEFAX: 212-218-2200 INFORMATION FOR SEQ ID NO: 1:
                                                                                                                                                        1465 aaaaaaaaaa 1474
||||||||||
                                                                                                                                                                                             1695 AAAGGAGTACATGAAGCGCATTGCATGAGTTTAACTTGTAGCTCCTTAATATTTTTAGGTA 1754
                                                                                                                                                                                                                                                                             1815 AAAAAAAAA 1824
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MOLECULE TYPE:
ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE CHARACTERISTICS:
LENGTH: 1824 base pairs
TYPE: nucleic acid
STRANDEDNESS: double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NAME: Perry, Lawrence S.
REGISTRATION NUMBER: 31865
TELECOMMUNICATION INFORMATION: .
TELEPHONE: 212-218-2100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OPERATING SYSTEM: MS-DOS Ver3.30
SOFTWARE: PATENT AID Ver1.0
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/606,505B
FILING DATE: 23-MAR-1996
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette - 3.50 inch, 720 Kb storage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: JP44963/92
FILING DATE: '02-MAR-1992
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQUENCES: 6
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: SHIMADA, Ritsuko
APPLICANT: OKINAKA, Yasushi
TITLE OF INVENTION: NOVEL PLANT GENES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                  IDENTIFICATION METHOD: by experiment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN: Falcon Blue
                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME/KEY: CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ADDRESSEE:
              APPLICANT: KIKUCHI, Yasuhiro
                                                                                                                                                                                                                                                                                                                              79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            10112-3801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KIKUCHI, Yasuhiro
KIYOKAWA, Shigeto
SHIMADA, Yukihisa
OHBAYASHI, Masaya
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    E: FITZPATRICK, CELLA, HARPER & SCINTO 30 Rockefeller Plaza
                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Petunia hybrida
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IBM PS/V
KIYOKAWA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cDNA to mRNA
                                                                                                                                                                                                                                                                                                                          0; Mismatches
                                                                                                                                                                                                                                                                                                                                  Score 48.4; DB 3; Length 1824; Pred. No. 0.00045;
                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                              뫄
                                                                                                                                                                                                                                        Ωy
                                                                                                                                                  밁
                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURE:
                                                                                                                                                                                                                                                                                                                                  79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SHIMADA, Yukihisa
```

```
RESULT 6
US-08-757-046A-5
US-08-757-046A-5
Sequence 5, Application US/08757046A
Patent NO. 5876995
GEMERAL INFORMATION:
APPLICANT: Bryan, Bruce
TITLE OF INVENTION: BIOLUMINESCENT
NUMBER OF SEQUENCES: 14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; SEQUENCE DESCRIPTION: SEQ ID NO: 1 US-09-616-990-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 3.3%; Score 48.4; DB 4; Length 1824; Best Local Similarity 60.8%; Pred. No. 0.00045;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INFORMATION FOR SEQ ID NO: 1 : SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                           1345 agagaagtaaatacaacagaacaggctaatatagtgttttgtatctgaacatctggccca 1404
                                                                                                                                                                                                                                                                   1815 AAAAAAAAA 1824
                                                                                                                                                                                                                                                                                                             1465 aaaaaaaaaa 1474
                                                                                                                                                                                                                                                                                                                                                    1695 AAAGGAGTACATGAAGCGCATTGCATGAGTTTAACTTGTAGCTCCTTAATATTTTAGGTA 1754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TOPOLOGY: linear MOLECULE TYPE: cDNA to mRNA ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME: Perry, Lawrence S.
REGISTRATION NUMBER: 31865
TELECOMMUNICATION INFORMATION:
TELEPHONE: 212-218-2100
TELEFAX: 212-218-2200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OPERATING SYSTEM: MS-DOS Ver3:30
SOFTWARE: PATENT AID Ver1.0
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STATE: New York
COUNTRY: U.S.A.
ZIP: 10112-3801
COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette - 3.50 inch,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER: JP44963/92 FILING DATE: 02-MAR-1992 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICATION NUMBER: US/09/616,990 FILING DATE: 14-Jul-2000 PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SHIMADA, Ritsuko
OKINAKA, Yasushi
TITLE OF INVENTION: NOVEL PLANT GENES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQUENCES: 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME/KEY: CDS
LOCATION: 116 to 1633
IDENTIFICATION METHOD: by experiment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN: Falcon Blue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LENGTH: 1824 base pairs TYPE: nucleic acid STRANDEDNESS: double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM: Petunia hybrida
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER: IBM PS/V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CITY: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE: FITZPATRICK, CELLA, HARPER & SCINTO STREET: 30 Rockefeller Plaza
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OHBAYASHI, Masaya
                                                BIOLUMINESCENT ARTICLES OF MANUFACTURE 14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             51; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     720 Kb storage.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
```

```
DATE: (1985);
DOCUMENT NUMBER: PATENT NO.: 5,093,240
US-08-757-046A-5
                                                                                                                                                                                                      В
                                                                                                                                             밁
                                                                                                                                                                         Ş
                                                                                      US-09-447-208-5
                                                                                                   RESULT
                                                     Sequence 5, Application US/09447208 Patent No. 6113886
                                                                                                                                                                                                                                                                              Best
                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                          Query Match
            GENERAL INFORMATION:
APPLICANT: Bryan, Bruce
TITLE OF INVENTION: BIO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAME: Seidman, Stephanie L
REGISTRATION NUMBER: 33,779
REFERENCE/DOCKET NUMBER: 6680-105B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 619-238-0999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE: 02-06-96 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ZIP: 92101-2926
COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
ADDRESSEE: Brown, Ma
                                                                                                                                                                                                                                                                                                                                                                                                                                      OTHER INFORMATION: appublication information:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                           HYPOTHETICAL: NO ANTI-SENSE: NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE CHARACTERISTICS:
LENGTH: 958 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                1376 tagtgttttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcggg 1435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORIGINAL SOURCE:
NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STREET: 1000
CTTY: San Diego
                                                                                                                                                                                                      APPLICATION NUMBER: 0 FILING DATE: 02-06-96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICATION NUMBER: US
FILING DATE: 11-25-96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME/KEY: Coding Sequence LOCATION: 115...702
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEFAX: 619-238-0062
                                                                                                                                                                                                                                                             Local Similarity les 67; Conserv
                                                                                                                                                                                                                                                                                                                                                                            PAGES: 3154-3158
                                                                                                                                                                                                                                                                                                                                                                                              VOLUME:
                                                                                                                                                                                                                                                                                                                                                                                                               JOURNAL:
                                                                                                                                                                                                                                                                                                                                                                                                                           AUTHORS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          E: Brown, Martin, Haller & McClain
1660 Union Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    USA
                                                                                                                                                                                                                                                                                                                                                                                                            Inouye et al.
Proc. Natl. Acad. Sci. U.S.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FastSEQ Version 1.5
                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 single
                                                                                                                                                                                                                                                                              3.2%;
               BIOLUMINESCENT ARTICLES OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                         apoaequorin-encoding gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US/08/757,046A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           08/597,274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               <u>ن</u>
                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                              Score 47.8;
Pred. No. 0.
                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                 8; DB 2;
0.00047;
                                                                                                                                                                                                                                                                   32;
                                                                                                                                                                                                                                                                                               Length 958;
                  MANUFACTURE
                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                   Gaps
```

Ç

Gaps

0,

```
; VOLUME: 82
; PAGES: 3154-3158
; DATE: (1985)
US-09-447-208-5
                          QΥ
                                                           B
                                                                                                                                 Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM: MEDIUM TYPE: Diskett
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NAME: Seldman, Stephanie L
REGISTION NUMBER: 33,779
REFERENCE, DOCKET NUMBER: 24:
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRIOR APPLICATION DATA:
APPLICATION NUMBER: 0
FILING DATE: 02-06-96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CLASSIFICATION:
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRIOR APPLICATION DATA:
APPLICATION NUMBER:
FILING DATE: 08-17-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOFTWARE: FastSEQ Vers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
               MOLECULE TYPE: cl
HYPOTHETICAL: NO
ANTI-SENSE: NO
                                                                                  1376 tagtgttttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcggg 1435
                                                                                                                                                                                                                                                               PUBLICATION INFORMATION:
PUBLICATION INFORMATION: PATENT NO.: 5,093,240
AUTHORS: Inouye et al.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FILING DATE: 02-06-96
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                           FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                       FRAGMENT TYPE:
                                                                                                                                                                                                                                                                                                                                                                         ORIGINAL SOURCE:
                                                        STREET: 4250 EXCITY: La Jolla
                                                                                                                                                                                                                                                                                                                                                                                                                                        TYPE: STRANDEDNESS: SIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: US/09/447, 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ZIP: 92037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE: Heller Ehrman White & McAuliffe STREET: 4250 Executive Square, 7th Floor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER:
                                                                                                                Local Similarity les 67; Conserva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEPHONE: 619-450-84
TELEFAX: 619-450-8499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CLASSIFICATION:
                                                                                                                                                                                                                                                                                                               OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                             NAME/KEY: Coding Sequence LOCATION: 115...702
                                                                                                                                                                                                                                                     JOURNAL:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       958 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    USA
                                                                                                                                                                                                                                                    Proc. Natl. Acad. Sci. U.S.A.
                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FastSEQ Version 1.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  619-450-8400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         08-17-98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11-25-96
                                                                                                                                                                                                                                                                                                                                                                                                                                                              single
                                                                                                                                                                                                                                                                                                                                                                                                                                    CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              acid
                                                                                                                                  3.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DOS
                                                                                                                                                                                                                                                                                                               apoaequorin-encoding gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0909/135,988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               08/757,046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    08/597,274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5.
                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24727-105C
                                                                                                                                  Score 47.8; DB 3; Pred. No. 0.00047;
                                                                                                                      Mismatches
                                                                                                                       32;
                                                                                                                                                  Length 958;
                                                                                                                       Indels
                                                                                                                       0;
```

```
Q
                                   밁
                                                              Ş,
                                                                                                                                                                  ; PAGES: 3154-
; DATE: (1985)
US-09-135-988-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-135-988-5
                                                                                                                        Query Match
                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 5, Application US/09135988 Patent No. 6152358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                           1376 tagtgttttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcggg 1435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NFORMATION FOR SEQ ID NO:
NAME/KEY: Coding Sequence
LOCATION: 115...702
OTHER INFORMATION: apoaequorin-encoding gene
PUBLICATION INFORMATION: PATENT NO.: 5,093,240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAME: Seidman, Stephanie L
REGISTRATION NUMBER: 33,779
REFERENCE/DOCKET NUMBER: 24:
TELECOMMUNICATION INFORMATION:
TELECHNONE: 619-450-8400
                         ORIGINAL SOURCE: FEATURE:
                                                                                                                                                                                                                                                                                                                                                              FRAGMENT TYPE:
                                                                                                                                                                                                                                                                                                                                                                         ANTI-SENSE: NO
                                                                                                                                                                                                                                                                                                                                                                                      HYPOTHETICAL:
                                                                                                                                                                                                                                                                                                                                                                                                     MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
LENGTH: 958 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FILING DATE: 02-06-96
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION: BIOLUMINESCENT ARTICLES OF NUMBER OF SEQUENCES: 14
                                                                                                                                                                                                                         AUTHORS:
JOURNAL:
                                                                                                       Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Bryan, Bruce
                                                                                                                                                                                                              VOLUME:
                                                                                                                                                                                                                                                                                                                                                                                                                      TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: 0: FILING DATE: 11-25-96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: US/09/135,988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FILING DATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADDRESSEE:
                                                                                            l Similarity
67; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                   nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         92037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    La Jolla
: CA
                                                                                                                                                                                              3154-3158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             E: Heller Ehrman White & McAuliffe 4250 Executive Square, 7th Floor
                                                                                          Conservative
                                                                                                                                                                                                                       Inouye et al.
Proc. Natl. Acad. Sci. U.S.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            619-450-8499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      USA
                                                                                                                                                                                                                                                                                                                                                                                                                      linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FastSEQ Version 1.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                          NO
                                                                                                                                                                                                                                                                                                                                                                                                        CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                 single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Diskette
                                                                                                       3.2%;
67.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     08/757,046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             08/597,274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              <u>ن</u>
                                                                                         0;
                                                                                                 Score 47.8; DB 3; Length 958; Pred. No. 0.00047;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24727-105C
                                                                                      Mismatches
                                                                                      32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MANUFACTURE
                                                                                      Indels
                                                                                  0; Gaps
```

```
RESULT 10
US-08-597-274A-5
                                                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-277-716-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-09-277-716-5
; Sequence 5, Application US/09277716A
; Patent No. 6232107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                             Sequence 5, Application US/08597274A Patent No. 6247995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQ ID NO 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OTHER INFURDACION:
PUBLICATION INFORMATION:
PATENT DOCUMENT NUMBER: 5,093,240
PATENT FILING DATE: 1987-10-08
PATENT FILING DATE: 1992-03-03
                                                                                                                                                                          GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION: LUCIFERASES, FLUORESCENT PROTEINS, NUCLEIC ACIDS ENCODING THE CURRENT APPLICATION NUMBER: US/09/277,716A

CURRENT FILING DATE: 1999-03-26

EARLIER APPLICATION NUMBER: 60/102,939

EARLIER FILING DATE: 1998-10-01

EARLIER FILING DATE: 1998-10-01

EARLIER APPLICATION NUMBER: 60/089,367

EARLIER FILING DATE: 1998-06-15

EARLIER APPLICATION NUMBER: 60/079,624

EARLIER APPLICATION NUMBER: 60/079,624

EARLIER FILING DATE: 1998-03-27

NUMBER OF SECTION NUMBER: 1998-03-27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Bryan, Bruce
APPLICANT: Szent-Gyorgy:
APPLICANT: PROLUME, LTD.
TITLE OF INVENTION: LUC1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AUTHORS: Inouye, S.
TITLE: Cloning and sequence analysis of cDNA for the luminescent protein
JOURNAL: Proc. Natl. Acad. Sci. USA
VOLUME: 82(10)
PAGES: 3154-3158
DATE: 1985-05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PUBLICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQ ID NOS: 32
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM: Aequorea (luminescent jellyfish)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LENGTH: 958
TYPE: DNA
                                                                                                                                                                                                                                                                                                                            1376 tagtgttttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcggg 1435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OTHER INFORMATION: Apoaequorin-encoding gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FEATURE:
NAME/KEY: CDS
                                                                                          NUMBER OF SEQUENCES:
                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LOCATION: (115)..(702)
                                                                                                                                     TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                          STREET: 1660 Un:
CITY: San Diego
STATE: CA
  COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                h 3.2%; Score 47.8; DB 4; Length 958; Similarity 67.7%; Pred. No. 0.00047;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bryan, Bruce
Szent-Gyorgyi, Christopher
                                                   1660 Union Street
USA
                                                                                                                                                      Bryan, Bruce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                     Brown, Martin, Haller & McClain
                                                                                                                               BIOLUMINESCENT NOVELTY ITEMS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         aequo
```

```
; PAGES: 3154-3158
; DATE: (1985)
US-08-597-274A-5
                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                 US-08-341-568-1
                                                                                                                                                             Sequence 1, Application US/08341568 Patent No. 5661021
                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SOFTWARE: FastSEQ Vers
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ZIP: 92101-2926
COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELECOMMUNICATION INFORMATION: TELEPHONE: 619-238-0999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                  1376 tagtgttttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcggg 1435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MOLECULE TYPE:
HYPOTHETICAL: N
ANTI-SENSE: NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME/KEY: Coding Sequence LOCATION: 115...702
OTHER INFORMATION: apoaeque PUBLICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FEATURE:
TITLE OF INVENTION:
            TITLE OF INVENTION: Mannanase enzymes, genes coding for them,
TITLE OF INVENTION: methods for isolating the genes, and methods for bleaching lie
                                              APPLICANT: Viikari, Liisa
APPLICANT: Penttila, Merja
APPLICANT: Saloheimo, Anu
APPLICANT: Marjatta, Ranua
                                                                                                                                 APPLICANT: Buchert, Johanna
                                                                                                               APPLICANT:
                                                                                                                                                                                                                                                                                                                                  AUTHORS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REGISTRATION NUMBER: 33,779
REFERENCE/DOCKET NUMBER: 6680-105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME: Seidman, Stephanie L
REGISTRATION NUMBER: 33,77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILING DATE: 02/06/
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                    Match 3.2%; Score 47.8; DB 4; Length 958; Local Similarity 67.7%; Pred. No. 0.00047;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEFAX: 619-238-0062
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VOLUME:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DOCUMENT NUMBER: 5,093,240 AUTHORS: Inouye et al.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                       67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FastSEQ Version 1.5
                                                                             Siika-aho, Matti
Viikari, Liisa
Penttila, Merja
                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Proc. Natl. Acad. Sci. U.S.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          02/06/96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             single
pulps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          apoaequorin-encoding gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US/08/597,274A
                                                                                                                                                                                                                                                                                                                                                                                                         0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                              0;
```

```
DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-341-568-1
                                                                                                                                                                                                                                                                                                                             US-08-911-020-1
                                                                                                                                                                                                                                                                                              Sequence 1, Application US/08911020 Patent No. 5854047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEFAX: (703) 205-8050
TELEX: 248345
INFORMATION FOR SEQ ID NO: 1:
                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME: Murphy Jr, Gerald M
REGISTRATION NUMBER: 28,977
REFERENCE/DOCKET NUMBER: 36
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 205-8000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NUMBER OF SEQUENCES: 7
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                               APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1364 aacaggctaatatagtgttttgtatctgaacatctggcccatcgtacattcagtaaagcc 1423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS
                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: Saloheimo, Anu APPLICANT: Marjatta, Ranua FITLE OF INVENTION: Mannanase enzymes, genes coding for them, TITLE OF INVENTION: methods for isolating the genes, and methoristic of INVENTION: lignocellulosic pulps
                                                                                                   CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                 APPLICANT:
                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STREET: PO Box 747
CITY: Falls Church
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE: 22
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY: US
ZIP: 22040-0747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US/08/341,568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: nucleic acid
COUNTRY: US
7TP: 22040-0747
                                     STREET: PO Box 747
CITY: Falls Church
STATE: VA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ENGTH:
                                                                                      ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ٧A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PO Box 747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QM9414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    536 base pairs
                                                                   E: Birch, Stewart, Kolasch and Birch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (703) 205-8050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                  Viikari, Liisa
                                                                                                                                                                                                                  Penttila, Merja
                                                                                                                                                                                                                                                 Siika-aho, Matti
                                                                                                                                                                                                                                                              Buchert, Johanna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Birch, Stewart, Kolasch and Birch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Trichoderma reesei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       22-NOV-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  365-262P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 47; DB 1;
Pred. No. 0.00057;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 536;
                                                                                                                                                         and methods
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                           for bleaching
```

COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk

```
US-09-027-137-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; STRAIN: QM9414
US-08-911-020-1
                                                                                                                                                                                                                                                                                                                                                                                   Sequence 2, Application US/09027137 Patent No. 6013450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/341
FILING DATE: 22-NOV-1994
ATTORNEY/AGENT INFORMATION:
NAME: Mulphy Jr, Gerald M
REGISTRATION NUMBER: 28,977
REGISTRATION NUMBER: 28,977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEX: 248345
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 536 base pairs
                                                           OPERATING SYSTEM: DOS
SOFTWARE: FastSEQ for Windows Version
CURRENT APPLICATION DATA:
                                                                                                                                                COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1364 aacaggctaatatagtgttttgtatctgaacatctggcccatcgtacattcagtaaagcc 1423
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                   APPLICANT: Hillman, Jennifer L.
APPLICANT: Corley, Neil C.
APPLICANT: Yue, Henry
TITLE OF INVENTION: CAF1-RELATE
                                                                                                                                                                                                                                                              CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                 NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MOLECULE TYPE:
ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELECOMMUNICATION INFORMATION: TELEPHONE: (703) 205-8000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: FILING DATE: Filed
                                                                                                                    COMPUTER:
                 CLASSIFICATION:
                                                                                                                                                                                                               CITY: Palo Alto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity hes 71; Conserv
                                                                                                                                MEDIUM TYPE:
                                                                                                                                                                  ZIP: 94304
                                                                                                                                                                                   COUNTRY:
                                                                                                                                                                                                                               ADDRESSEE: Incyte Pharmaceuticals, Inc. STREET: 3174 Porter Dr.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TYPE: nucleic acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICATION NUMBER: US/0 FILING DATE: 13-AUG-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                 CA
                                                                                                                                                                                 USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (703) 205-8050
                                                                                                            IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Trichoderma reesei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  linear
                                                                                                                                  Diskette
                                 Filed Herewith
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDNA
                                                                                                                                                                                                                                                                                            Henry
ON: CAF1-RELATED PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3.2%;
                                               US/09/027,137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     us/08/911,020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US 08/341,568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      365-262P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 47; DB 2;
Pred. No. 0.00057;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 536;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0,
```

```
RESULT 14
US-08-897-340-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-027-137-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 1, Application US/08897340 Patent No. 5955306 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEFAX: 650-845-4166 INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS:
                           NAME: Silveri, Jean M.
REGISTRATION NUMBER: 39,030
REFERENCE/DOCKET NUMBER: MNI-005CP
TELECOMMUNICATION INFORMATION:
                                                                         FILING DATE: 17-SEP-1996
ATTORNEY/AGENT INFORMATION:
NAME: Silveri, Jean M.
                                                                                                                                                                                                 OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                      CLASSIFICATION: 435
PRIOR APPLICATION NUMBER: US 08/715,032
                                                                                                                                                                                                                                                              COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1460 aaaaaaaaaaaaaaa 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1340 ttaagagagaagtaaatacaacagaacaggctaatatagtgttttgtatctgaacatctg 1399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE/DOCKET NUMBER: PF
TELECOMMUNICATION INFORMATION:
TELEPHONE: 650-855-0555
                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2552 AAAAAAAAAAAAAA 2566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: FILING DATE: ATTORNEY/AGENT INFORMATION: NAME: Billings, Lucy J.
                                                                                                                                                                                                                                                                                                                                                                                                           NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY: line
IMMEDIATE SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDILL
LIBRARY: FILL
TONE: 2229466
                                                                                                                                                                    FILING DATE:
                                                                                                                                                                                                                                                    COMPUTER:
              TELEPHONE:
                                                                                                                                                                                    APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                               COUNTRY:
                                                                                                                                                                                                                                                                                                                                STATE:
                                                                                                                                                                                                                                                                                                                                              CITY:
                                                                                                                                                                                                                                                                                                                                                            STREET:
                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME: Billings, Lucy J.
REGISTRATION NUMBER: 36,749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8O;
                                                                                                                                                                                                                                                                                                  02109
                                                                                                                                                                                                                                                                                                                                              Boston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nucleic acid
EDNESS: single
                                                                                                                                                                                                                                                                                                                              Massachusetts
                                                                                                                                                                                                                                                                                                                                                          28 State Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2852 base pairs
: (617)227-7400
(617)227-5941
                                                                                                                                                                                                                                                                                                               USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROSNOT16
                                                                                                                                                                                                                                                                                                                                                                                                                                       Gimeno, Carlos J. and Errada, Patrick, R.
/ENTION: Weight Control Pathway Genes and Uses
                                                                                                                                                                                                                                               E: Floppy disk
IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                linear
                                                                                                                                                                                                                                                                                                                                                                         LAHIVE & COCKFIELD, LLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                        Therefor
                                                                                                                                                                                    US/08/897,340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 47; DB 3; Pred. No. 0.0014; 0; Mismatches 5:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PF-0476 US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 3; Length 2852;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    55;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
```

<u>.</u>

```
; TOPOLOGY: 1i
; MOLECULE TYPE:
US-08-897-340-1
                                                                                                                                                ; TOPOLOGY: 11; MOLECULE TYPE: US-09-252-329-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
    QV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-09-252-329-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 1, Application US/09252329
Patent No. 6147192
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 3.2%; Score 46.6; DB 2; Length 1386; Best Local Similarity 64.6%; Pred. No. 0.0012; Matches 64; Conservative 3; Mismatches 32; Indels 0
                                         Query Match 3.2%; Score 46.6; DB 3; Length 1386; Best Local Similarity 64.6%; Pred. No. 0.0012; Matches 64; Conservative 3; Mismatches 32; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INFORMATION FOR SEQ ID NO: 1
SEQUENCE CHARACTERISTICS:
LENGTH: 1386 base pairs
TYPE: nucleic acid
                                                                                                                                                                                                                                                                                               TELEFAX: (617)227-5941 INFORMATION FOR SEQ ID NO: 1:
                                                                                                                                                                                                                                                                                                                                    ATTORNEY AGENT INFORMATION:
NAME: Silveri, Jean M.
REGISTRATION NUMBER: 39,030
REFERENCE/DOCKET NUMBER: MNI-
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1267 TTGGTTTTTCATTTTTTGTCCCCTTTCCCCTAGATCCAGAATAAAGTTTAAGRGRAGSGC 1326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1376 tagtgttttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcggg 1435
                                                                                                                                                                                                            SEQUENCE CHARACTERISTICS:
LENGTH: 1386 base pairs
TYPE: nucleic acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Gimeno, Carlos J. and Errada, Patrick, R.
TITLE OF INVENTION: Weight Control Pathway Genes and Uses
TITLE OF INVENTION: Therefor
1376 tagtgttttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcggg 1435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES: 3: CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: nucleic acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Boston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Massachusetts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    28 State Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         USA
                                                                                                                                                                                        linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LAHIVE & COCKFIELD, LLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDNA
                                                                                                                                                                           CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          08/897,340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      us/09/252,329
                                                                                                                                                                                                                                                                                                                                                                                     MNI-005CP
                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                  0;
```

```
В
          Qy
1267 TTGGTTTTTGTTGTTGTCCCTTTGCCCTAGATCCAGAAATAAAGTTTAAGRGRAGSGC 1326
```

Search completed: October 2, 2001, 05:48:56 Job time: 3226 sec

B

,				
	-			
			,	

욙

GenCore version Copyright (c) 1993 - 2000

4.5 Compugen Ltd.

```
Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Minimum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9n:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB seq length: DB seq length:
A_Geneseq_0601:*

//SIDSB/gcgdata/geneseq/geneseqp/AA1980.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1982.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1983.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1983.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1983.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1985.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1985.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1986.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1987.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1987.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1989.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1991.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1991.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1992.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1993.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1993.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1997.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1997.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1997.DAT:*
//SIDSB/gcgdata/geneseq/geneseqp/AA1999.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     October 1, 2001, 16:27:27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        412676 seqs, 60623988 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-537-654-2
1530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MGDQSGSRNGPQQKYVSGAQ.....VTGKGIRDAVSSNHKRARVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Search time 20.7 Seconds (without alignments) 861.036 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          412676
```

and i	score	Fred.
and is derived by analysis of the total score distribution.	greater	NO.
d by a	than	tue ut
nalysi	or equ	mber o
s of t	al to 1	I resu.
ne tota	the scc	res bre
ıl scor	re of	GTCLEG
e dist	the re	ру ст
ribut	sult.	ance
ion.	being	רט זומע
	printed	ם

SUMMARI	

Ħ

Result No.	Score	% Query Match	% Query Match Length DB	DB	ID	Description
-4	1530	100.0	294	22	AAY71974	Maize RAD51 orthol
2	1530	100.0	294	22	AAY71976	Maize RAD51 orthol
ω	1450	94.8	281	22	AAY71975	Maize RAD51 orthol
4	576.5	37.7	376	21	AAY73340	HTRM clone 2398682
υī	324	21.2	350	21	AAY91937	Ala163 modified hu
6	323	21.1	350	19	AAW56264	Human recombinase
7	323	21.1	350	21	AAY91932	. Human Rec2 serine
8	313	20.5	350	19	AAW56265	Mouse recombinase
9	313	20.5	350	21	AAY91933	Murine Rec2 serine
10	300	19.6	286	21	AAG43527	Zea mays protein f
11	300	19.6	344	21	AAG43526	Zea mays protein f

New maize RAD51 polynucleotides, useful for e.g. controlling recombination or transformation efficiency in plants, or as pamplification primers for detecting, quantifying or isolating

probes or gene

		μŅ	487 340	6.1	94 93.5	5 4
Streptococcus pneu	1 AAY81563	21	764	6. 2	95	3 2
_		بر ر	438		96	Ξ
12		Ν	384	•	97.5	0
Arabidopsis thalia			198		97.5	9
Helicobacter pylor			347		101	8
Helicobacter pylor			273	6.6	101	37
Deduced sequence o			273		101	8
Protein involved i	0 AAY37531		386	6.7	103	5
Bacteriophage Dp-1			386		104	4
pCTD ORF 1. Chlam			451	٠	107	ω
ЗS			462	7.4	113.5	ວ
Porphorymonas ging			461		113.5	Ξ
Recombinase enzyme	7 AAW01871		781	8.2	126	ö
Arabidopsis thalia			128	9.0	137.5	29
			159		153	8
Arabidopsis thalia			189	13.1	200	?7
DNA replication an			346		243	6
ZmRAD51A amino aci			340		271.5	
Fission yeast RAD5			365		276	4
Glycine max RAD51			344	18.2	278.5	ũ
recc			343	٠	279.5	ö
Mammalian Rad51 pr			339		•	ŭ
Sequence of the sp			339			ö
ā			339			٥
Prod. of gene part			339		•	œ
prote			339		•	7
Sequence of the sp	9 AAW62523		339	٠	281.5	Ġ
Human RAD51 protei			339		281.5	ĊΠ
ZmRAD51B amino aci			340	18.5		4
۲,	AAW630		344	٠	299	ω
Zea mays protein f	1 AAG43525	2	372	19.6	300	N

4444333333333322222222222222

## ALIGNMENTS

```
AAY71974
                                                                                                                                                                        Maize; RAD51 orthologue; RAD52 epistasis group; double strand break; DSB; homologous recombination; transformation; gene targetting; transgenic plant; DNA repair.
                               WPI; 2001-016092/02.
N-PSDB; AAD02118.
                                                                                                                                                                                                          Maize RAD51 orthologue protein
                                                                                                                                                                                                                                            AAY71974;
                                                                                                                                                                                                                                                            AAY71974 standard;
                                                         Mahajan PB,
                                                                                         05-MAY-1999;
                                                                                                          05-APR-2000; 2000WO-US09010.
                                                                                                                          16-NOV-2000.
                                                                                                                                         WO200068370-A2
                                                                                                                                                          Zea mays.
                                                                                                                                                                                                                           28-MAR-2001
                                                                        (PION-) PIONEER HI-BRED INT INC.
                                                                                                                                                                                                                                                                           1
                                                                                                                                                                                                                           (first entry)
                                                        Shi J;
                                                                                         99US-0132582.
                                                                                                                                                                                                                                                            Protein;
                                                                                                                                                                                                                                                            294 AA
```

```
PRX PPN XXX XXX ACC
                                                                                                                                                                                                                                                                                                                                       RESULT
AAY71976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                      Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The present sequence is a maize RAD51 orthologue protein #1. RAD51 is one CC of the genes of the RAD52 epistasis group that is involved in double CC strand breaks (DSBs) repair by homologous recombination. Control of CC homologous recombination by modulating RAD51 is used for improving CC transformation and gene targetting in transgenic plants. The RAD51 CC nucleotide may be used as probes or amplification primers for detecting, CC quantifying or isolating gene transcripts, in detecting deficiencies in CC the mRNA level during screening for desired transgenic plants, for CC changes in enzyme activity, for detecting any number of allelic variants, CC orthologues or paralogues of the gene, or for site directed mutagenesis CC in eukaryotic cells. It may also be used for recombinant expression of CC screening of antibodies, and in sense or antisense suppression of one or CC concepts in a host cell, tissue or plant. The RAD51 proteins may be CC used in assays to agonise or antagonise the enzyme function, or as immunogens or antigens to obtain antibodies.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
05-MAY-1999;
                               05-APR-2000; 2000WO-US09010.
                                                                                             WO200068370-A2
                                                                                                                                                       Maize; RAD51 orthologue; RAD52 epistasis group; double strhomologous recombination; transformation; gene targetting; transgenic plant; DNA repair.
                                                               16-NOV-2000
                                                                                                                              Zea
                                                                                                                                                                                                                        Maize RAD51 orthologue protein
                                                                                                                                                                                                                                                                                                                      AAY71976 standard; Protein; 294 AA
                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Watch 100.0%; Local Similarity 100.0%; Local Similarity 100.0%; nes 294; Conservative (
                                                                                                                                                                                                                                                                                                                                                      N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGG 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                           VPGVGKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP 120
                                                                                                                                                                                                                                                                                                                                                                                                HSCTNRLILHWNGNERYAHLDKSPSLPVASAPYAVTGKGIRDAVSSNHKRARVT 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HFRQDFEDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDSWS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HSHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTF 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      vpgvgktqlgiqlainvqipvecgglggkavyidtegsfmvervyqiaegcirdilehfp 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Page 69-70; 76pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     294 AA;
                                                                                                                                                                                                                                                       (first entry)
99US-0132582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1530; DB 22;
Pred. No. 3.3e-157;
0; Mismatches 0;
                                                                                                                                                                                                                         #3
                                                                                                                                                                                          double strand
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 294;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
```

```
В
                                                                                                                                                                             Query Match
Best Local
                                                                            Matches
                                                                                                                                                                                                            the mRNA level during screening for desired transgenic plants, for detecting gene mutations, for monitoring upregulation of expression or changes in enzyme activity, for detecting any number of allelic variants, orthologues or paralogues of the gene, or for site directed mutagenesis in eukaryotic cells. It may also be used for recombinant expression of its encoded polypeptide, or for use as immunogen in preparing and/or screening of antibodies, and in sense or antisense suppression of one or more genes in a host cell, tissue or plant. The RAD51 proteins may be used in assays to agonise or antagonise the enzyme function, or as immunogens or antigens to obtain antibodies.
                                                                                                                                                                                                                                                                                                                                                                                                             The present sequence is a maize RAD51 orthologue protein #3. RAD51 is on of the genes of the RAD52 epistasis group that is involved in double strand breaks (DSBs) repair by homologous recombination. Control of homologous recombination by modulating RAD51 is used for improving transformation and gene targetting in transgenic plants. The RAD51 nucleotide may be used as probes or amplification primers for detecting, quantifying or isolating gene transcripts, in detecting deficiencies in
                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 1; Page 74-75; 76pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                New maize RAD51 polynucleotides, useful for e.g. controlling recombination or transformation efficiency in plants, or as paramplification primers for detecting, quantifying or isolating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mahajan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (PION-) PIONEER HI-BRED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2001-016092/02
                                                                            294;
                                                                                             Similarity
                                                                                                                                                                           294 AA;
                                                                            Conservative
                                                                                             100.0%; Score 1530; DB 22; 100.0%; Pred. No. 3.3e-157;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INT INC
                                                                          0;
                                                                          Mismatches
                                                                          0;
                                                                            Indels
                                                                                                             Length 294;
                                                                          0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         probes
                                                                        Gaps
                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       one
```

```
241
                                                           181
                                                                                        181
                                                                                                                     121
                                                                                                                                                   121
                                                                                                                                                                                 61
                                                                                                                                                                                                              61
                                                                                                                                                                                                                                           Н
                                                                                                                                                                                                                                     HFRQDFEDLALRTRYLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDSWS
                                                                                                                                  HSHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTF
                                                                                                                                                                                           VPGVGKTQLG1QLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP
                             HSCTNRLILHWNGNERYAHLDKSPSLPVASAPYAVTGKGIRDAVSSNHKRARVT
                                                          hfrqdfedlalrtrvlsglslklmkiaktynlavvllnqvttkftegsfqltlalgdsws
                                                                                                                     hsheksssvqkqlqperfladiyyfricsyteqiavinymekflrehkdvriviidsvtf
                                                                                                                                                                              vpgvgktqlgiqlainvqipvecgglggkavyidtegsfmvervyqiaegcirdilehfp
                                                                                                                                                  180
                                                                                                                                                                              120
                                                                                                                                                                                                          120
                                                                                                                                                                                                                                          60
                                                                                      240
                                                                                                                     180
                                                                                                                                                                                                                                                                                                  0;
```

RESULT AAY71975

ω

AAY71975 standard; Protein; 281 AA.

28-MAR-2001

(first entry)

Maize RAD51 orthologue protein

Maize; RAD51 orthologue; RAD52 epistasis group; double strand break; homologous recombination; transformation; gene targetting;

```
밁
                                Qy
                                                                      밁
                                                                                                      Ωy
                                                                                                                                            В
                                                                                                                                                                          Qy
                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                             The present sequence is a maize RAD51 orthologue protein #2. RAD51 is one CC of the genes of the RAD52 epistasis group that is involved in double Strand breaks (DSBs) repair by homologous recombination. Control of CC homologous recombination by modulating RAD51 is used for improving CC transformation and gene targetting in transgenic plants. The RAD51 CC nucleotide may be used as probes or amplification primers for detecting, CC quantifying or isolating gene transcripts, in detecting deficiencies in CC the mRNA level during screening for desired transgenic plants, for CC detecting gene mutations, for monitoring upregulation of expression or CC changes in enzyme activity, for detecting any number of allelic variants, CC orthologues or paralogues of the gene, or for site directed mutagenesis CC in eukaryotic cells. It may also be used for recombinant expression of CC screening of antibodies, and in sense or antisense suppression of one or more genes in a host cell, tissue or plant. The RAD51 proteins may be considered to the control of the enzyme function, or as
                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Claim 11; Page 72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          New maize RAD51 polynucleotides, useful for e.g. controlling recombination or transformation efficiency in plants, or as paramplification primers for detecting, quantifying or isolating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   05-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     05-APR-2000; 2000WO-US09010.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO200068370-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 transgenic plant; DNA repair.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mahajan PB,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (PION-) PIONEER HI-BRED INT INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         16-NOV-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               immunogens or antigens to obtain antibodies.
 239
                                     241
                                                                         179
                                                                                                          181
                                                                                                                                               119
                                                                                                                                                                                  121
                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                     Local Similarity
                                                                                                                                                                                                                                                                                                         MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGG
                                   HSCTNRLILHWNGNERYAHLDKSPSLPVASAPYAVTGKGIRD 282
                                                                                                                                                                                                                VPGVGKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP 120
hsctnrlilhwngneryahldkspslpvasapyavtgkgird
                                                                                                        HFRQDFEDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDSWS 240
                                                                                                                                                                            HSHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTF 180
                                                                                                                                                                                                                                                                                      mgdqsgsrngpqqkyvsgaqnawdmfsdelsqkhittgsgdlndilgggihckevteigg 60
                                                                    hfrqdfedlalrtrvlsglslklmkiaktynlavvllnqvttkftegsfqltlalgdsws
                                                                                                                                            hsheksssvqkqlqperfladiyyfricsyteqiavinymekflrehkdvriviidsvtf 178
                                                                                                                                                                                                                                                                                                                                                                    280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             281 AA;
                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99US-0132582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       76pp; English.
                                                                                                                                                                                                                                                                                                                                                                                   94.8%;
                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                 Score 1450; DB 22; Pred. No. 1.4e-148;
                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             probes
                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or
```

```
AAY73340
ID AAY7
  of the HTRM polypeptides are useful for treating or preventing disorders associated with increased expression or activity of HTRMs. HTRM polypeptides, their immunogenic fragments or oligopeptides are useful for screening libraries of compounds in drug screening techniques. Polypucleotides encoding HTRM are useful for blocking the transcription of mRNA and regulating gene function by modulating the activity of HTRM. Vectors expressing HTRM or agonists can also be used to prevent or treat disorder associated with decreased HTRM expression. Antibodies
                                    differences in gene sequences among normal, carrier and affected individuals. Using diagnostic assays, cancer can be detected prior to the appearance of clinical symptoms and thereby progression of cancer can be prevented by aggressive treatment or preventive measures.
                                                                                                                   which specifically bind HTRM and polynucleotides encoding HTRM are useful for diagnosing disorders associated with the expression of HTRM, particularly in assays that detect the expression of HTRM. Nucleotide sequences encoding HTRM may be useful to generate hybridization probes useful in mapping the naturally occurring genomic sequence and to detect
                                                                                                                                                                                                                                                                                                                                                                                           leukaemia; immune disorders such as AIDS, Addison's disease, diabetes mellitus, rheumatoid arthritis, multiple sclerosis, systemic lupus erythematosus, and myasthenia gravis; infections and trauma. Antagonists
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein sequences. The HTRM protein and nucleotide sequences are userumed for preventing or treating disorders associated with decreased expression or activity of HTRM which include cell proliferative disorders such as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAY73325-Y73389 are human transcriptional regulator molecule (HTRM) protein sequences. The HTRM protein and nucleotide sequences are useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    07-AUG-1998;
02-OCT-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HTRM; human transcriptional regulatory molecule; arteriosclerosis; AIDS; arteriosclerosis; cirrhosis; cancer; leukaemia; diabetes mellitus;
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                         arteriosclerosis and cirrhosis; cancers including adenocarcinoma and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-PSDB; AAZ52425.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Addison's disease; multiple sclerosis; rheumatoid arthritis; infection; trauma; myasthenia gravis; adenocarcinoma; immune disorder; treatment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HTRM clone 2398682 protein sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAY73340 standard; Protein; 376 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (INCY-) INCYTE PHARM INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           05-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    04-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            immune disorders
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             peptides useful for diagnosis, prevention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2000-052941/04.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Page 100-101; 193pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Patterson C,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bandman O,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  98US-0095827
98US-0102745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98US-0084254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99WO-US09935
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lal P, Yue H,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Baughn MR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  , Reddy R,
Azimzai Y,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               and treatment of cancer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Tang YT;
Lu DAM;
```

Qy

Matches Query Match Best Local

125;

Conservative

47;

Similarity

37.78; 43.98;

Score 576.5; DB 2 Pred. No. 7.4e-54; Mismatches

DB 21;

Length 376;

Indels

15;

Gaps

```
RESULT
AAY91937
 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ₽
          The present sequence is Ala163 hsRec2, a human serine kinase modified a Y163A substitution. The hsRec2 is in the same supergene family as t mammmalian protein having homologous pairing and strand transfer activities, RAD51 and was isolated because of its homology to the homologous pairing and strand transfer protein of Ustilago maydis. In particular, hsRec2 phosphorylates several proteins that control the ce cycle, especially cyclin E and p53. The invention permits the phosphorylation of cell cycle control proteins at sites that are physiologically relevant. The invention can be practiced with either murine or human Rec2 or a mutein or chimera of these proteins. In
                                                                                                                                                                                                          Phosphorylating a serine-containing substrate by incubating it adenosine triphosphate and Rec2 kinase and measuring the level phosphorylation, useful for discovering specific antagonists or
                                                                                                                                                                  Claim 18; Page -; 41pp;
                                                                                                                                                                                                                                                                 WPI:
                                                                                                                                                                                                                                                                                           Havre PA,
                                                                                                                                                                                                                                                                                                                  (UYJE-) UNIV JEFFERSON THOMAS (CORR ) CORNELL RES FOUND INC (KIME-) KIMERAGEN INC.
                                                                                                                                                                                                                                                                                                                                                                             21-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                 30-MAR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       phosphorylation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ala163 modified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19-JUL-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAY91937;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAY91937 standard;
 particular
                                                                                                                                                                                                                                                                                                                                                                                                     17-SEP-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO200017329-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 326 lykspsqkectvlfqikpqgfrdtvvtsacslqtegslstrkrsr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              260 LDKSPSLPVASAPYAVTGKGIRDAV-----SSNHKRAR 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          u
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          {\tt shiyyfrcrdytellaqvyllpdflsehskvrlvivdgiafpfrhdlddlslrtrllngl}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aqqmislannhrlaviltnqmttkidrnqallvpalgeswghaatirlifhwdrkqrlat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDSWSHSCTNRLILHWNGNERYAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EC-GGLGGKAYYIDTEGSFMVERVYQIAEGCIRDI-LEHFPHSHEKSSSVQKQLQPERFL
                                                                                                                                                                                                                                                                 2000-283562/24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFEDLALRTRVLSGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       serine kinase; homologous pairing; strand transfer; RAD51;
rylation; cyclin E; p53; cell cycle.
                                                                                                                                                                                              of Rec2
 the mutein has
                                                                                                                                                                                                                                                                                          Rice MC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                                                                                                             98US-0157603
                                                                                                                                                                                                                                                                                                                                                                                                       99WO-US21642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               human Rec2 serine kinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Protein;
                                                                                                                                                                                                                                                                                           Holloman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Y163A substitution
                                                                                                                                                                  English.
the sequence of a Rec2 kinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 350
                                                                                                                                                                                                                                                                                           X,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A
                                                                                                                                                                                                                                                                                           Kmiec
                                                                                                                                                                                                                                                                                             EB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        from wild
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     370
 containing other
                                                                                                                                                                                                                                     į
                                                                                                                                                                                                             õ
                                                                                                                                                                                                                          of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              265
                                                                                 ij
                                                                                                                           d by
```

```
Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      88888888%&
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAW56264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               than a Tyr at position 163. The invention comprises a method of phosphorylating a serine-containing substrate comprising incubati substrate with ATP (adenosine triphosphate) and Rec2 kinase or a mammalian Rec2 and measuring the level of phosphorylation. The museful for discovering compounds which are specific antagonists of the form of the 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Кеу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Homo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Recombinase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Human recombinase hsREC2 protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                28-AUG-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAW56264 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Note: The present sequence is not shown in the specification but is derived from the hsRec2 sequence given on pages 33-34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agonists of Rec2
                                                19-MAR-1998.
                                                                                              WO9811214-A1
                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         apoptosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAW56264;
                                                                                                                                                                                                                                                                                                                      Modified-site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ntwshsvntrlilgyldserrgiliaksplapftsfvytikeegl 342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LSLKLMKIAKTYNLAVVLLNQVTTKF------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               egavvyidtesafsaerlveiae-----srfprafnte-----ekllltsskvh 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sadfspaflsttlsaldealhggvacgslteitgppgcgktqfcimmsilatlptnmggl 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SDELSOKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGL 86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DSWSHSCTURLILHWNGNERYAHL-DKSPSLPVASAPYAVTGKGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      easslkylaeefsipviltnqitthlsgalasqadlvspaddlslsegtsgsscviaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE-----DLALRTRVLSG 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   lyreltcdevlqriesleeeiis-kgiklvildsvasvvrkefdaqlqgnlkernkflar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFL---ADIY 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             88; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cancer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REC2; hsREC2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the hsRec2 sequence given on pages
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                        /note= "S
                                                                                                                                                                                                                     /label= DNA
/note= "DNA binding
                                                                                                                                                                                                                                                                                                                         160..163
                                                                                                                                                                                                                                                                                                                                                                                              108..116
                                                                                                                                                                                                                                                                                                                                                                       /label= A-box
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                         /label=
                                                                                                                                                                                                                                                                                                                                             /note= "A box motif sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                   /note-
                                                                                                                                                                                                                                                                                                                                                                                                                                               /label= NLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            human.
                                                                                                                                                                                                   . 210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    21.2%;
                                                                                                                                             "B box motif"
                                                                                                                                                                                                                                                                                               "Src-type
                                                                                                                                                                                                                                                                                                                                                                                                                     "nuclear localisation sequence"
                                                                                                                                                                    в-вох
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 homologous recombination; irradiation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 324; DB 21; pred. No. 1.4e-26; 0; Mismatches 99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Å
                                                                                                                                                                                                                                                                                               phosphorylation
                                                                                                                                                                                                                       sequence'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 350;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TEGSFQLTLALG 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 incubating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              The method
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ŀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7;
```

11-SEP-1997;

97WO-IB01217

```
Ş
                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                           δĀ
                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local :
Кеу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATP-dependent recombinase of Ustilago maydis (USREC2). Its amino acid sequence was deduced from cDNA clones (see AAV22703) isolated on the basis of homology to UmREC2. Overexpression of mammalian REC2 (see also AAW56265) in a cell facilitates homologous recombination between an exogenous DNA and the genome of a cell It also sensitises the cell to DNA damage, e.g. by gamma or UV radiation or from cytotoxic agents. This causes the cell to undergo apoptosis in response to DNA damage. The haracz gene can be used in gene therapy protocols and in a method for constitution of the cell to DNA damage.
                  Homo sapiens
                                                                                                                               AAY91932 standard; Protein; 350 AA
                                      phosphorylation;
                                                                   Human Rec2 serine kinase.
                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                            be used in gene therapy protocols and in a method for classifying human tissue for medical purposes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This polypeptide comprises the human homologue, HSREC2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim 5; Fig 1A-B; 88pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mammalian and human REC2 genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N-PSDB; AAV22703
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Holloman WK,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11-SEP-1996;
                                                                                                                                                                                                                                                                                    143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (UYJE-) UNIV
                                                                                                                                                                                                                                                                188
                                                                                                                                                                                                                                                                                                        135
                                                                                                                                                                                                                                                                                                                            87
                                                                                                                                                                                                                                                                                                                                                 75
                                                                                                                                                                                                                                                                                                                                                                    27
                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                   7
                                                                                                                                                                                                  GDSWSHSCTNRLILHWNGNERYAHL-DKSPSLPVASAPYAVTGKGI 280
                                                                                                                                                                                                                                                              vlqriesleeeii--
                                                                                                                                                                              gntwshsvntrlilqyldserrqiliaksplapftsfvytikeegl 342
                                                                                                                                                                                                                                                                                                                                           reasslkylaeefsipviltnqitthlsgalasqadlvspaddlslsegtsgsscviaal
                                                                                                                                                                                                                                            GLSLKLMKIAKTYNLAVVLLNQVTTKF------
                                                                                                                                                                                                                                                                                 YYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE-----DLALRTRVLS
                                                                                                                                                                                                                                                                                                     egavvyidtesafsaerlveiae-----srfpryfnteekllltsskvhlyreltcde
                                                                                                                                                                                                                                                                                                                         GGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP---HSHEKSSSVQKQLQPERFL-ADI 142
                                                                                                                                                                                                                                                                                                                                                                  SDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1998-207378/18.
                                   serine kinase; homologous pairing; strand transfer; rylation; cyclin E; p53; cell cycle.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CORNELL RES FOUND INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 or the sensitisation of cells
                                                                                                                                                                                                                                                                                                                                                                                                                                         350 AA;
                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                       (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JEFFERSON THOMAS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Kmiec EB,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 96US-0025929
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                21.1%; 32.2%;
                                                                                                                                                                                                                                                            ·-----skgiklvildsvasvvrkefdaqlqgnlkernkfla
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Rice
                                                                                                                                                                                                                                                                                                                                                                                        44;
                                                                                                                                                                                                                                                                                                                                                                                               Score 323; DB 19;
Pred. No. 1.8e-26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ΜĊ,
                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Shu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Z,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATP-dependent recombinase(s) to the apoptotic effects of
                                                                                                                                                                                                                                                                                                                                                                                       100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Smith
                                                                                                                                                                                                                                          -----TEGSFQLTLAL
                                                                                                                                                                                                                                                                                                                                                                                                           Length 350;
                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                      50;
                                               RAD51;
                                                                                                                                                                                                                                                                                  197
                                                                                                                                                                                                                                                                                                                                                                  86
                                                                                                                                                                                                                        296
                                                                                                                                                                                                                                                             236
                                                                                                                                                                                                                                                                                                                                                                                     7;
                B
                                  Ωy
                                                      밁
                                                                         Qγ
                                                                                               밁
                                                                                                                                                                                        Matches
                                                                                                                                                                                        Sequence
                188
                                    143
                                                       135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Havre PA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            30-MAR-2000
                                                                          87
                                                                                               75
```

```
the same supergene family as the mammmalian protein having homologous pairing and strand transfer activities, RAD51 and was isolated because of its homology to the homologous pairing and strand transfer protein of Ustilago maydis. In particular, hsrec2 phosphorylates several proteins that control the cell cycle, especially cyclin E and p53. The invention permits the phosphorylation of cell cycle control proteins at sites that are physiologically relevant. The invention can be practiced with either murine or human Rec2 or a mutein or chimera of these proteins. In particular the mutein has the sequence of Rec2 kinase containing other than a Tyr at position 163. The invention comprises a method of phosphorylating a serine-containing substrate comprising incubating the substrate with ATP (adenosine triphosphate) and Rec2 kinase or a mammalian Rec2 and measuring the level of phosphorylation. The method is useful for discovering compounds which are specific antagonists or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Phosphorylating a serine-containing substrate by incubating it with adenosine triphosphate and Rec2 kinase and measuring the level of phosphorylation, useful for discovering specific antagonists or agonists of Rec2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        agonists of Rec2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 18; Page 33-34; 41pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (UYJE-) UNIV JEFFERSON THOMAS (CORR ) CORNELL RES FOUND INC (KIME-) KIMERAGEN INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N-PSDB; AAA08553.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 2000-283562/24.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17-SEP-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WO200017329-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Modified-site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 present sequence is the hsRec2, a human serine kinase.
                                                                                                                                                                                                                                                                                                                                                           SDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGL 86
                                                             vlqriesleeeii-----skgiklvildsvasvvrkefdaqlqgnlkernkfla
                                                                                                                          YYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE-----DLALRTRVLS 197
                                                                                                                                                                                           egavvyidtesafsaerlveiae-----srfpryfnteekllltsskvhlyreltcde
                                                                                                                                                                                                                                                        GGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP---HSHEKSSSVQKQLQPERFL-ADI 142
                                                                                                                                                                                                                                                                                                                     sadfspaflsttlsaldealhggvacgslteitgppgcgktqfcimmsilatlptnmggl 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Rice MC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              99WO-US21642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note=
163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4..7
/label= nuclear_localization_signal
108..116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label= A_Box_motif
160..163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label= B_Box_motif
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               186..199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note= "preferaby any amino acid other than
    tyrosine in the claimed method"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      21.1%; 32.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Holloman WK,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "src-type phosphorylation site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                          44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 323; DB 21;
Pred. No. 1.8e-26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Kmiec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 350;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
TEGSFQLTLAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                          50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                          7;
```

δÃ

```
RESULT
AAW56265
                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                     В
δõ
                             밁
                                                       Qy
                                                                                                               Qy
                                                                                                                                                                                                                                                recombination between an exogenous DNA and the genome of a cell. It also sensitises the cell to DNA damage, e.g. by gamma or UV radiation or from cytotoxic agents. This causes the cell to undergo apoptosis in response to DNA damage. The muREC2 gene can used in the construction of transgenic animals and knock-out mice useful as models for tumorigenesis induced by chemical pathogens.
                                                                                                                                                                                                                                                                                                                                          This polypeptide comprises the murine homologue, muREC2, of the ATP-dependent recombinase of Ustilago maydis (UsREC2). Its amino acid sequence was deduced from a cDNA clone (see AAV2704) isolated on the basis of homology to UmREC2. Overexpression of mammalian REC2 (see also AAW56264) in a cell facilitates homologous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (CORR )
(UYJE-)
                                                                                                                                                                                                                                                                                                                                                                                                                                 Disclosure; Fig 1E-F; 88pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mammalian and human REC2 genes encoding useful for the sensitisation of cells
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         11-SEP-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11-SEP-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   19-MAR-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WO9811214-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mus musculus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        apoptosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mouse recombinase muREC2 protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 28-AUG-1998 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAW56265 standard;
                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-PSDB; AAV22704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Holloman WK,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Recombinase; REC2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                irradiation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                236 GDSWSHSCTNRLILHWNGNERYAHL-DKSPSLPVASAPYAVTGKGI 280 |::|||| | || | | | | : :|:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        : | :|: ::: |:| ||:||
237 reasslkylaeefsipviltnqitthlsgalasqadlvspaddlslsegtsgsscviaal
 130 Q--KQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE 187
                             125 atlptslgglegavvyidtesaftaerlveiae-----srfpqyfnteekllltssrv
                                                          77
                                                                                     65 qtayelktrrsahlspaflsttlcaldealhggvpcgslteltgppgcgktqfcimmsvl 124
                                                                                                                 20 QNAWDM---FSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAIN 76
                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gntwshsvntrlilgyldserrgiliaksplapftsfvytikeegl 342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1998-207378/18
                                                         VQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP---HSHEK----SSSV 129
                                                                                                                                                 100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               UNIV JEFFERSON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cancer;
                                                                                                                                                                                                                          350 AA;
                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Kmiec EB,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           96US-0025929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     97WO-IB01217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RES FOUND INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      hsREC2; homologous recombination; irradiation;
                                                                                                                                                                 20.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 THOMAS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Rice
                                                                                                                                                 46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            350
                                                                                                                                                                 Score 313; DB 19;
Pred. No. 2.2e-25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ď,
                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Shu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATP-dependent recombinase(s) to the apoptotic effects of
                                                                                                                                                   98;
                                                                                                                                                                             Length 350;
                                                                                                                                                   Indels
                                                                                                                                                   68;
                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             296
                                                                                                                                                                                                                                                                                       be
                                                                                                                                                    13;
```

```
RESULT
AAY91933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
   δ
V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                 The present sequence is the muRec2, a murine serine kinase. It is in the same supergene family as the mammmalian protein having homologous pairing and strand transfer activities, RADS1 and was isolated because of its homology to the homologous pairing and strand transfer protein of its homology in particular, muRec2 phosphorylates several proteins that control the cell cycle, especially cyclin E and p53. The invention permits the phosphorylation of cell cycle control proteins at sites that are physiologically relevant. The invention can be practiced with either are physiologically relevant.
murine or human Rec2 or a mutein or chimera of these proteins. In particular the mutein has the sequence of a Rec2 kinase containing other than a Tyr at position 163. The invention comprises a method of phosphorylating a serine-containing substrate comprising incubating the substrate with ATP (adenosine triphosphate) and Rec2 kinase or a
                                                                                                                                                                                                                                                    Disclosure; Page 34-36; 41pp; English
                                                                                                                                                                                                                                                                                                    phosphorylating a serine-containing substrate by incubating it with adenosine triphosphate and Rec2 kinase and measuring the level of phosphorylation, useful for discovering specific antagonists or
                                                                                                                                                                                                                                                                                                                                                                                               WPI; 2000-283562/24.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                (UYJE-) UNIV JEFFERSON THOMAS (CORR ) CORNELL RES FOUND INC (KIME-) KIMERAGEN INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mus musculus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                muRec2; serine kinase; homologous pairing; strand transfer; RAD51;
phosphorylation; cyclin E; p53; cell cycle.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Murine Rec2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         19-JUL-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAY91933;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAY91933 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                              N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                Havre PA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          17-SEP-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             30-MAR-2000.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WO200017329-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   341 gl---vlqgher 349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        281 slsegtsgssclvaalgntwghcvntrlilgyldserrgiliaksplaaftsfvytikge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          222 pklqgnikernkflgkgasl-lkylagefsipviltnqitthlsgalpsqadlvspaddl 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GIRDAVSSNHKR 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----TEGSFQLTLALGDSWSHSCTNRLILHWNGNERYAHL-DKSPSLPVASAPYAVTGK 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----DLALRTRVL-SGLSLKLMKTAKTYNLAVVLLNQVTTKF-----
                                                                                                                                                                                                                                                                                                                                                                              AAA08554.
                                                                                                                                                                                                                                                                                                                                                                                                                                Rice MC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        serine kinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          99WO-US21642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note= "preferaby any amino acid other than
tyrosine in the claimed method"
                                                                                                                                                                                                                                                                                                                                                                                                                                    Holloman WK,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  350 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                    Kmiec EB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   224
```

```
RESULT 10
AAG43527
      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SSSSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                      25-FEB-1999

05-MAR-1999

09-MAR-1999

23-MAR-1999

23-MAR-1999

25-MAR-1999

01-APR-1999

06-APR-1999

16-APR-1999

11-APR-1999

11-APR-1999
                                                                                                                                                                                                                                                                            Zea
                                                                                                                                                                                                                                                                                               Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter; termination sequence; corn.
                                                                                                                                                                                                                                                                                                                                                                                                                       AAG43527 standard; Protein; 286 AA.
                                                                                                                                                                                                   25-FEB-2000;
                                                                                                                                                                                                                           06-SEP-2000
                                                                                                                                                                                                                                                   EP1033405-A2.
                                                                                                                                                                                                                                                                                                                                                 Zea mays
                                                                                                                                                                                                                                                                                                                                                                      18-OCT-2000 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     mammalian Rec2 and measuring the level of phosphorylation. The meuseful for discovering compounds which are specific antagonists or agonists of Rec2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  341 gl---vlqgher 349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           279 GIRDAVSSNHKR 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20 QNAWDM---FSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAIN 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
                                                                                                                                                                                                                                                                        mays subsp. mays.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              slsegtsgssclvaalgntwghcvntrlilgyldserrgiliaksplaaftsfvytikge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----TEGSFQLTLALGDSWSHSCTNRLILHWNGNERYAHL-DKSPSLPVASAPYAVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                hlcreltcegllq----rlesleeeii-----skgvklvivdsiasvvrkefd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q--KQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP---HSHEK----SSSV 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              qtayelktrrsahlspaflsttlcaldealhggvpcgslteitgppgcgktqfcimmsvl 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 100;
                                                                                                                                                                                                                                                                                                                                                protein fragment SEQ ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                350 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                   2000EP-0301439.
  99US-0126264
99US-0126785
99US-0127462
99US-0128234
99US-0128714
99US-012874
99US-0130077
99US-0130044
99US-013051
99US-0130891
99US-01314449
                                                                                                                                      99US-0123548.
99US-0125788.
                                                                                                                                                               99US-0121825.
99US-0123180.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20.5%; Score 313; DB 21; Length 350; 32.1%; Pred. No. 2.2e-25; tive 46; Mismatches 98; Indels 6
                                                                                                                                                                                                                                                                                                                                                NO:
                                                                                                                                                                                                                                                                                                                                                54415.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The method is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          224
  30-APR-1999
30-APR-1999
00-MAY 1999
00-MAY 1999
00-MAY 1999
01-MAY 1999
11-MAY 1999
11-MAY
990S-0132048
990S-0132487
990S-0132485
990S-0132486
990S-0132486
990S-0132486
990S-0132487
990S-0134219
990S-0134219
990S-013427
990S-013427
990S-013427
990S-013427
990S-013427
990S-013427
990S-013427
990S-013427
990S-013427
990S-013622
990S-014623
990S-014433
990S-014433
990S-014433
990S-014433
990S-014433
990S-014433
990S-014433
990S-014433
990S-014433
```

99US-0145086. 99US-0145088. 99US-0145085. 99US-0145087.

```
RESULT 11
AAG43526
ID AAG43526
  망
                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21-0CT-1999
21-0CT-1999
21-0CT-1999
21-0CT-1999
21-0CT-1999
21-0CT-1999
22-0CT-1999
22-0CT-1999
22-0CT-1999
25-0CT-1999
25-0CT-1999
26-0CT-1999
26-0CT-1999
28-0CT-1999
28-0CT-1999
28-0CT-1999
28-0CT-1999
29-0CT-1999
25-FEB-1999;
05-MAR-1999;
09-MAR-1999;
23-MAR-1999;
25-MAR-1999;
29-MAR-1999;
                                                                                                                                                 protein identification; signal transduction pathway; metabolic pathway;
hybridisation assay; genetic mapping; gene expression control; promoter;
termination sequence; corn.
                                                                                        06-SEP-2000
                                                                                                                               Zea mays subsp. mays.
                                                                                                                                                                                       Zea mays protein fragment SEQ ID NO: 54414.
                                                                                                                                                                                                             18-OCT-2000
                                                                     25-FEB-2000;
                                                                                                             EP1033405-A2
                                                                                                                                                                                                                                                                                                     258
                                                                                                                                                                                                                                                                                                                        257
                                                                                                                                                                                                                                                                                                                                                                                 139
                                                                                                                                                                                                                                                                                                                                                               201
                                                                                                                                                                                                                                                                                                                                                                                                    144
                                                                                                                                                                                                                                                                                                                                                                                                                         99
                                                                                                                                                                                                                                                                                                                                                                                                                                           84
                                                                                                                                                                                                                                                                                                                                                                                                                                                              39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24 DMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Match
                                                                                                                                                                                                                                                                                                              YAHLDKSPSLPVASAPYAVTGKGIRD 282
                                                                                                                                                                                                                                                                                                                                                                                           YFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLS
                                                                                                                                                                                                                                                                                                    vckifdapnlpegeavfqvtsggimd
                                                                                                                                                                                                                                                                                                                                         {\tt srltkia} ee fnvavy itn qviadpgggmfitdpkk pagghvlahaatirlmlrkgk geqr
                                                                                                                                                                                                                                                                                                                                                   LKLMKIAKTYNLAVVLLNQVTTKFTEGSF---QLTLALGDSWSHSCTNRLILH-WNGNER
                                                                                                                                                                                                                                                                                                                                                                               hggngkvayidtegtfrperivpiae----
                                                                                                                                                                                                                                                                                                                                                                                                                                        GGLGGKAYYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIY 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                            \tt dlllkrksvvrittgsqaldellgggietlciteafgefrsgktqlahtlcvstqlpihm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ;88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    h 19.6%;
Similarity 33.1%;
88; Conservative 4
                                                                                                                                                                                                                                                    standard; Protein;
                                                                                                                                                                                                             (first entry)
                                                                      2000EP-0301439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9908-0160741

9908-0160767

9908-0160770

9908-0160814

9908-0160815

9908-0160980

9908-0160980

9908-0161404

9908-0161404

9908-0161405

9908-0161406

9908-0161359

9908-0161361

9908-0161361

9908-0161361

9908-0161393

9908-0161393
  99US-0121825.
99US-0123180.
99US-0123548.
99US-0125788.
99US-0126264.
99US-0126785.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -:::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; Score 300; DB
; Pred. No. 4.2e
41; Mismatches
                                                                                                                                                                                                                                                    344
                                                                                                                                                                                                                                                                                                     283
                                                                                                                                                                                                                                                    A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 21;
.2e-24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 286;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                         -rfgmdanavldnii 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    83
                                                                                                                                                                                                                                                                                                                                                                                   197
                                                                                                                                                                                                                                                                                                                                                                256
                                                                                                                                                                                                                                                                                                                                                                                                       200
                                                                                                                                                                                                                                                                                                                                             257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5
```

21-JUL-1999
22-JUL-1999
22-JUL-1999
22-JUL-1999
22-JUL-1999
22-JUL-1999
23-JUL-1999
23-JUL-1999
24-JUL-1999
27-JUL-1999
27-JUL-1999
27-JUL-1999
27-JUL-1999
28-JUL-1999
29-AUG-1999
20-AUG-1999
20-AUG-1999
20-AUG-1999
20-AUG-1999
21-AUG-1999
22-AUG-1999
23-AUG-1999
24-SEP-1999
25-AUG-1999
26-AUG-1999
27-AUG-1999
27-AUG-1999
28-SEP-1999
29-AUG-1999
21-AUG-1999
21-AUG-1999
21-AUG-1999
22-SEP-1999
23-AUG-1999
24-SEP-1999
25-AUG-1999
26-AUG-1999
27-AUG-1999
27-AUG-1999
28-SEP-1999
29-AUG-1999
21-AUG-1999
21-AUG

990S-0145089
990S-0145185
990S-0145218
990S-0145218
990S-0145218
990S-0145913
990S-0145913
990S-0145913
990S-0145913
990S-0146388
990S-0147204
990S-0147204
990S-0147204
990S-0147204
990S-0147204
990S-0147204
990S-0147493
990S-0147493
990S-0148311
990S-0148341
990S-014936
990S-014936
990S-014936
990S-014936
990S-0151066
990S-014937
990S-0151066
990S-01510666
990S-0151066
990S-0151066
990S-0151066
990S-0151066
990S-0151066
990S-0147066
990S-0147066
990S-0147066
990S-0147066
990S-0147066
990S-0147066
990S-0147066
990S-0147066
990S-0147066
990S-0147

א קים אין	PR PR
1966-60000000000000000000000000000000000	01-AF 06-AF
APR-1999; APR-19	\PR-199 \PR-199
	-sn66 -sn66 -sn66
	1 - 1 - 1 -
29845 30449 30449 310891 310891 310891 310891 320486 322486 32486 32486 32486 32486 34216 342	62. 34.
	ק ק ק
PR R R R R R R R R R R R R R R R R R R	
11-7010 1	3-JUL 9-JUL 101-6
THE 1999; THE 19	
- Sn66 -	9US-0
\$\circ\$-0144352 \$\circ\$-0144352 \$\circ\$-0144352 \$\circ\$-0144863 \$\circ\$-0145086 \$\circ\$-0145086 \$\circ\$-0145085 \$\circ\$-0145085 \$\circ\$-0145085 \$\circ\$-0145085 \$\circ\$-0145085 \$\circ\$-0145085 \$\circ\$-0145085 \$\circ\$-0145085 \$\circ\$-0145216 \$\circ\$-0145216 \$\circ\$-0145216 \$\circ\$-0145216 \$\circ\$-0145216 \$\circ\$-0145216 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0147036 \$\circ\$-0151086 \$\circ\$-0151086 \$\circ\$-0151086 \$\circ\$-0151086 \$\circ\$-0151303 \$\circ\$-0151336 \$\circ\$-0154736 \$\circ\$-0155458 \$\circ\$-0157753 \$\circ\$-0158232 \$\circ\$-0158232 \$\circ\$-0158232	14433 14433 14433
5000501768966998887090080306554560093065845519915336307022889861998986599758654400	

```
RESULT :
                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PR R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R R P R P R R P R R P R P R R P R P R R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P R P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local s
Matches 88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            13-OCT-1999
13-OCT-1999
13-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
18-OCT-1999
21-OCT-1999
21-OCT-1999
21-OCT-1999
21-OCT-1999
21-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
25-OCT-1999
25-OCT-1999
26-OCT-1999
26-OCT-1999
28-OCT-1999
28-OCT-1999
28-OCT-1999
28-OCT-1999
29-OCT-1999
            06-SEP-2000
                                             EP1033405-A2
                                                                                                                      Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                                                                                                                                                                         Zea mays protein fragment SEQ ID NO: 54413.
                                                                                                                                                                                                             18-OCT-2000
                                                                                                          termination sequence;
                                                                                                                                                                                                                                                                            AAG43525 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                       316 vckifdapnlpegeavfqvtsggimd 341
                                                                                                                                                                                                                                                                                                                                                                                   257 YAHLDKSPSLPVASAPYAVTGKGIRD 282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              144
                                                                                                                                                                                                                                                                                                             12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               24
                                                                          mays subsp. mays.
                                                                                                                                                                                                                                                                                                                                                                                                                                         DMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVEC
                                                                                                                                                                                                                                                                                                                                                                                                                :| |||: :|:|| : |||
srltkiaeefnvavyitnqviadpgggmfitdpkkpagghvlahaatirimlrkgkgeqr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRODFE---DLALRTRVLSGLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIY 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       hggngkvayidtegtfrperivpiae-------rfgmdanavldnii 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               l Similarity
88; Conserv
                                                                                                                                                                                                          (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          990S-0159329.
990S-0159331.
990S-0159637.
990S-0159637.
990S-0160741.
990S-0160768.
990S-0160768.
990S-0160815.
990S-0160815.
990S-0160815.
990S-0161406.
990S-0161406.
990S-0161406.
990S-0161406.
990S-0161406.
990S-0161406.
990S-0161406.
990S-0161406.
990S-0161359.
990S-0161359.
990S-0161920.
990S-0161920.
990S-0161920.
990S-0161920.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             19.6%;
                                                                                                            corn.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             41;
                                                                                                                                                                                                                                                                            372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 300; DB 21;
Pred. No. 5.5e-24;
11; Mismatches 109;
                                                                                                                                                                                                                                                                            AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 344;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ū
     25-FEB-1999
05-MAR-1999
05-MAR-1999
23-MAR-1999
25-MAR-1999
25-MAR-1999
26-MAR-1999
06-APR-1999
08-APR-1999
08-APR-1999
08-APR-1999
08-APR-1999
08-APR-1999
08-APR-1999
23-APR-1999
23-APR-1999
24-MAY-1999
06-MAY-1999
06-MAY-1999
06-MAY-1999
07-MAY-1999
14-MAY-1999
14-MAY-1999
14-MAY-1999
14-MAY-1999
14-MAY-1999
14-MAY-1999
14-MAY-1999
14-MAY-1999
16-JUN-1999
16-JUN-1999
16-JUN-1999
18-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            25-FEB-2000;
99US-0121825

99US-0123548

99US-0125788

99US-0125788

99US-0126785

99US-0126785

99US-0128714

99US-013049

99US-0130449

99US-0132487

99US-0132487

99US-0132487

99US-0132487

99US-0132487

99US-0132487

99US-0134218

99US-0134218

99US-0134218

99US-0134218

99US-0134218

99US-0134218

99US-0134218

99US-013421

99US-0134218

99US-0139451

99US-0140951

99US-0141842

99US-0142055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2000EP-0301439
```

```
RESULT 13
AAW63042
ID AAW630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      $\text{$\pi$ $\pi$ $\pi$
                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                      뭥
                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
XEXEX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24-SEP-1999
28-SEP-1999
29-SEP-1999
04-OCT-1999
06-OCT-1999
07-OCT-1999
07-OCT-1999
12-OCT-1999
13-OCT-1999
13-OCT-1999
13-OCT-1999
14-OCT-1999
14-OCT-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  14-OCT-1999
14-OCT-1999
14-OCT-1999
18-OCT-1999
21-OCT-1999
21-OCT-1999
21-OCT-1999
21-OCT-1999
21-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
23-OCT-1999
24-OCT-1999
26-OCT-1999
26-OCT-1999
26-OCT-1999
27-OCT-1999
28-OCT-1999
28-OCT-1999
29-OCT-1999
              AtDMC1 protein sequence
                                                                                             AAW63042;
                                                                                                                                 AAW63042 standard;
                                                    06-OCT-1998 (first entry)
                                                                                                                                                                                                                              284
                                                                                                                                                                                                                                                                                                                                                                                      225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              125
                                                                                                                                                                                                                                                                                                                                                                                                                             144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     84 GGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIY 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24 DMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVEC
                                                                                                                                                                                                                                                                                                     YAHLDKSPSLPVASAPYAVTGKGIRD 282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 hggngkvayidtegtfrperivpiae-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19.6%;
milarity 33.1%;
Conservative 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9908-0155659
9908-01575659
9908-015717
9908-0157865
9908-0157865
9908-0158029
9908-0158293
9908-0159294
9908-0159331
9908-0159331
9908-0159331
9908-0159584
9908-0159584
9908-0160741
9908-0160741
9908-0160768
9908-0160768
9908-0160815
9908-0160815
9908-0160815
9908-0161406
9908-0161406
9908-0161406
9908-0161406
9908-0161406
9908-0161406
9908-0161359
9908-0161359
9908-0161359
9908-0161359
9908-0161359
9908-0161359
                                                                                                                                 Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; Score 300; DB 21; Length 37; Pred. No. 6.1e-24; 41; Mismatches 109; Indels
                                                                                                                                   344
                                                                                                                                   ΑA
                                                                                                                                                                                                                                  369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----rfgmdanavldnii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 372;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       83
                                                                                                                                                                                                                                                                                                                                                                                          283
                                                                                                                                                                                                                                                                                                                                                                                                                               200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     224
                                                                                                                                                                                                                                                                                                                                                256
```

99US-0142803
99US-0142970
99US-0143542
99US-0144086
99US-0144086
99US-0144331
99US-0144333
99US-0144333
99US-0144333
99US-0144333
99US-0144333
99US-0144333
99US-0144333
99US-01445193
99US-0145145
99US-0145145
99US-0145145
99US-0145145
99US-0145145
99US-0145145
99US-0145145
99US-0145145
99US-0147192
99US-0147193
99US-0147193
99US-0147193
99US-0149723
99US-0151066
99US-0151065
99US-0151065
99US-0151063

110-AUG-1999
111-AUG-1999
12-AUG-1999
13-AUG-1999
16-AUG-1999
16-AUG-1999
20-AUG-1999
20-AUG-1999
20-AUG-1999
20-AUG-1999
23-AUG-1999
23-AUG-1999
25-AUG-1999
27-AUG-1999

22-JUL-1999 23-JUL-1999 23-JUL-1999 23-JUL-1999 26-JUL-1999 27-JUL-1999 27-JUL-1999 27-JUL-1999 27-JUL-1999 27-JUL-1999 27-JUL-1999 28-JUL-1999 28-JUL-1999 02-AUG-1999 02-AUG-1999 04-AUG-1999 04-AUG-1999 05-AUG-1999 06-AUG-1999 06-AUG-1999 06-AUG-1999 06-AUG-1999 09-AUG-1999

21-JUL-1999; 21-JUL-1999; 21-JUL-1999; 22-JUL-1999; 22-JUL-1999; 19-JUL-1999; 19-JUL-1999; 19-JUL-1999;

19-JUL-1999 19-JUL-1999 19-JUL-1999 20-JUL-1999 15-JUL-1999; 16-JUL-1999; 16-JUL-1999;

08-JUL-1999; 09-JUL-1999;

12-JUL-1999; 13-JUL-1999; 14-JUL-1999;

```
RESULT 1
AAY42376
ID AAY4
XX
AC AAY4
                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                    밁
                                                                                                                                                  Ş
                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The present sequence is encoded by the Arabidopsis thaliana melsosis-specific DMC1 gene (AtDMC1). The AtDMC1 promoter and homologues can be used to confer melsosis specific expression on a sequence operably linked to the promoter. They can be used for e.g. ablation of melotic cells and isolation of apomictic plants, designing an efficient homologous recombination system for plants, increasing melotic recombination frequency, for introgression of alien chromosome segments into host plant, or altering normal events of cell cycle during the time of melosis and producing male and female sterile plants. The promoters can also be used in searching for apomictic mutants or used by seed producers to produce seeds apomittically. They can also be used for
AAY42376
                                 AAY42376 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              New isolated Arabidopsis meiosis-specific promoter - useful meiosis-specific transcription of genes, e.g. for isolation apomictic plants or removing DNA from transgenic plants
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Arabidopsis thaliana meisosis-specific DMC1 gene; AtDMC1; promoter; meiosis specific expression; ablation; meiotic cell; isolation; apomictic plant; increase; meiotic recombination; introgresssion; sterile plant; seed production.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Disclosure; Fig 7; 69pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (INNE-) INNES CENT INNOVATIONS LTD JOHN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     24-DEC-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     24-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       02-JUL-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO9828431-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Arabidopsis thaliana
                                                                                                                    307
                                                                                                                                                      249
                                                                                                                                                                                       247
                                                                                                                                                                                                                         192
                                                                                                                                                                                                                                                        188
                                                                                                                                                                                                                                                                                        135
                                                                                                                                                                                                                                                                                                                        148
                                                                   14
                                                                                                                                                                                                                                                                                                                                                        75
                                                                                                                                                                                                                                                                                                                                                                                         92
                                                                                                                                                                                                                                                                                                                                                                                                                         15
                                                                                                                  frkgkgdtrvckvydapnlaeaeasfqitqggiada
                                                                                                                                                  LH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRDA
                                                                                                                                                                                                                                                                                                                     vttqlptnmkggngkvayidtegtfrpdrivpiae-------rfgmd
                                                                                                                                                                                                                                                                                                                                                    INVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQ 134
                                                                                                                                                                                                                                                                                                                                                                                                        YVSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLA 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1998-377661/32
                                                                                                                                                                                                                     RTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSF---QLTLALGDSWSHSCTNRLI
                                                                                                                                                                                                                                                     pgavldniiyaraytyehqynlllglaakmse-epfrilivdsiialfrvdftgrgelad
                                                                                                                                                                                    rqqklaqmlsrlikiaeefnvavymtnqviadpgggmfisdpkkpagghvlahaatirll
                                                                                                                                                                                                                                                                                     PERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLAL 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                           90;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          any unwanted DNA sequences from transgenic plants.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Jones JDG,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            344 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                      -dalikrksvvkittgcqalddllgggietsaiteafgefrsgktqlahtlc 147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     96GB-0026858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     97WO-GB03546
                                 Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         19.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Klimyuk VI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         42;
                                 340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 299; DB 1
Pred. No. 7e-24;
                                 A
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 344;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                         32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              of
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                      187
                                                                                                                                                                                                                   248
                                                                                                                                                                                                                                                     246
                                                                                                                                                                                                                                                                                                                                                                                                                                                         6
              Š
                                                 밁
                                                                                 Ωy
                                                                                                                 밁
                                                                                                                                                Qγ
                                                                                                                                                                                    Вb
                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                      This is the amino acid sequence of the ZmRAD51B recombinase enzyme. CC The RAD51 recombinase from S.cerevisiae has a role in the catalysis of the in vitro pairing and strand exchange between circular viral cC single strand DNA and linear duplex DNA. The identification of the ZmRAD51 genes will allow the identification and characterisation of the functional activities of recombinase enzymes from plants. The two isolated cDNAs (AAX11868 and AAX11872) are more closely related CC The two isolated cDNAs (AAX11868 and AAX11872) are more closely related CC meab51 family members expressed in mitotic cells than to the meiosis specific homologues from plants (LIM15) and yeast (DWC1), CC despite the significant transcription levels of the genes, that have been detected primarily in immature ears and anthers that contain cells progressing through the early stages of meiosis.

CC The sequences claimed by the invention can be used to modulate the activity of RAd51 recombinase in transgenic plants, especially in maize. The genes can be used in gene targeting systems and for generating transgenic plants, especially in maize.
                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Claim 8; Page 42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Maize recombinase genes ZmRAD51A and ZmRAD51B useful targeting system and production of transgenic plants
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Rothstein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (PION-) PIONEER HI-BRED INT INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13-FEB-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11-FEB-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     W09941394-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     expression vector; plasmid;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      recombinase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10-DEC-1999
                                               240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    19-AUG-1999.
              246 RLILH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRD
                                                                                 190
                                                                                                                    204
                                                                                                                                                    133
                                                                                                                                                                                    146
                                                                                                                                                                                                                     78
                                                                                                                                                                                                                                                     86
                                                                                                                                                                                                                                                                                     18 GAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINV 77
                                                                                                                                                                                                                                                                                                                                    Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1999-527374/44
DB; AAZ11870.
                                               sarqmhlakflrslqkladefgvavvitnqvvaqvdgaamfagpqikpiggnimahastt
                                                                                 ALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSF----QLTLALGDSWSHSCTN
                                                                                                                                                                                                                                                   gftsasqlhaqrleiiqlttgsreldqildggietgsitemygefrsgktqlchtlcvtc 145
                                                                                                                                                  LQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE----DL
                                                                                                                                                                                  qlpldqgggegkalyidaegtfrpqrilqiadrfglnga--dvlenvayarayntdhqsr
                                                                                                                                                                                                     QIPVECGGLGGKAVYIDTEGSFMVERVYQIAE-----GCIRDILEHFPHSHEKSSSVQKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Chamberlin MA,
                                                                                                                                                                                                                                                                                                                                                                                                         340 AA;
                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene targeting; gene insertion; transgenic plant;
ector; plasmid; meiosis-specific homologue.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99WO-US02900
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         66pp; English.
                                                                                                                                                                                                                                                                                                                                    18.5%;
                                                                                                               -aasmmvetrf-----almvvdsatalyrtdfsgrgel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Drummond
                                                                                                                                                                                                                                                                                                                     50;
                                                                                                                                                                                                                                                                                                                                    Score 283.5;
Pred. No. 3.
                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ВJ,
                                                                                                                                                                                                                                                                                                                                      .3e-22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 McElver
                                                                                                                                                                                                                                                                                                                                                    DB 20;
                                                                                                                                                                                                                                                                                                                   106;
```

for gene

Indels Length 340;

39;

Gaps

7;

245 239

밁

300 rlflrkgrgeerickvisspclaeaearfqissegvtd 337

```
RESULT 15
AAR78183
ID AAR7818
XX AAR7818
XX DAA MT 15-FEB
XX DNA MT 15-FEB
XX UNA MT 15-FEB
XX PAGE 10-10
XX DNA MT 15-FEB
XX PAGE 10-10
XX DNA MT 15-FEB
XX UNA MT 15-FEB
XX UN
                                       Ş
                                                                                                      В
                                                                                                                                                               δÃ
                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                 γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNA coding for a RAD51 protein having the amino acid sequence in AAR78183 is claimed. The RAD51 protein, which contains an ATP-binding domain, is involved in DNA repair of mismatched base pairs and site-specific recombination in antibody gene rearrangements. The protein binds to double-stranded DNA to form a right-handed helical nucleoprotein that extends (by 1.5 times) the pitch of B-form DNA. A a result, the helix is unwound. The RAD51 protein will be useful in designing drugs to treat diseases associated with environmental DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Structural gene encoding RAD51, used in production of RAD51 - used to study drugs against diseases caused by DNA damage, e.g. by UV or X radiation, and to improve efficiency of gene therapy targetting
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 1; Page 16-17; 19pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N-PSDB; AAQ91763.
261 DKSPSLPVASAPYAVTGKGIRDA 283
                                                                            207 AKTYNLAVVLLNQVTTKFTEGSFQLTL-----ALGDSWSHSCTNRLILH-WNGNERYAHL 260
                                                                                                                                                                                                                                                                                                                                                         162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 1995-236467/31.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (TOYM ) TOYOBO KK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      28-MAY-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  28-MAY-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    06-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JP07143890-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Homo sapiens.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA mismatch repair; DNA recombination; site-specific; unwinding; right-handed helical nucleoprotein; RAD51; human; recA;
                                                                                                                                                                                                                                                                         150 YTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLMKI 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                            topoisomerase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Human RAD51 protein, involved in DNA repair.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15-FEB-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAR78183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAR78183 standard; Protein; 339 AA.
                                                                                                                                                                                                                                                                                                                                                                                                    95 TEGSFMVERVYQIAE-----GCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICS 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity 30.4 es 80; Conservative
                                                                                                                                                                                                                 -----yqasammvesryallivdsatalyrtdysgrgelsarqmhlarflrmllrl 255
                                                                                                                                                                                                                                                                                                                                     tegtfrperllavaeryglsg--sdvldnvayarafntdhqtqll------ 204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                339 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   93JP-0127594.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  93JP-0127594.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              18.4%; Score 281.5; DB 16; Length 339; 30.4%; Pred. No. 5.4e-22; vative 46; Mismatches 96; Indels 41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 41; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  As
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7;
```

Db 315 ydspclpeaeamfainadgvgda 337

Search completed: October 1, 2001, 16:28:15 Job time: 48 sec

Run

```
Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                              Database
                                                                                                                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                              Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          on:
                                                                                                                                                                                                                                                                                                                                                                              ••
US-09-537-654-1
1474
1 tegacecaegegte
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     October 2, 2001, 04:52:04; Search time 2002.11 Seconds (without alignments) 11387.717 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                              GenEmbl: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IDENTITY_NUC
Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1344157 seqs, 7733874588 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                          9b_pat1: *
9b_pat2: *
9b_ph: *
9b_pl1: *
9b_pl2: *
9b_pl3: *
9b_pl4: *
em_ba1: *
em_ba2: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gb_ba1:*
gb_ba2:*
gb_ba3:*
                                                                                                                                                                                                                                                                                                        gb_om:*
                                                                                                                                                                                                                                                                                                                         gb_in1:*
gb_in2:*
gb_in3:*
                                                                                                                              em_htgo_hum:*
em_htgo_lnv:*
em_htgo_lnv:*
em_htg_hum1:*
em_htg_hum2:*
em_htg_hum3:*
em_htg_hum4:*
em_htg_hum6:*
em_htg_hum6:*
em_om:*
em_or:*
                                 em_hum5:*
em_hum6:*
                                                          em_hum2:*
em_hum3:*
                                                                                                     em_htg_inv2:*
                                                                                                              em_htg_inv1:*
                                                                                                                                                                                                                  em_fun:*
                em_in:*
                          em_hum7:*
                                                                                      em_htg
                                                                                              em_htg_other:*
                                                                                                                       em_htg_hum8:*
                                                                                     _rod:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                          2688314
```

			·
99994321	74 776 776 777 777 778 779 881 881 881 881	772:::::::::::::::::::::::::::::::::::	44444450000000000000000000000000000000
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		t t g g g g g g g g g g g g g g g g g g	pat- ph: ph: ph: ph: ro: sts: sts: sts: sts: sts:

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIES

8	c 7	6	5	4	ω	2	_	Result No.
103.4	171	171	178.4	358.8	1243.2	1305.4	1474	Score
7.0	11.6	11.6	12.1	24.3	84.3	88.6	100.0	Query Match
1123	163419	139652	1295	1101	1459	1333	1474	Query Match Length DB
91	13	83	88	13	9	9	9	DB
BC000667	AP002908	AP003310	AF029669	ATH299424	AX046603	AX046605	AX046601	ID
BC000667 Homo sapi	AP002908 Oryza sat	AP003310 Oryza sat	AF029669 Homo sapi	AJ299424 Arabidops	AX046603 Sequence	AX046605 Sequence	AX046601 Sequence	Description

60

60

0;

120

180 180

```
RESULT 1
AX046601
LOCUS
DEFINITION
ACCESSION
VERSION
KEYWORDS
SOURCE
                                                                                                                                                                                                                  FEATURES
                                                                                                                                                                                                                                                                                                REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0 0
                                                                                                                                                                                                                                                                AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                 ORGANISM
                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                   source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1001.4

187.2.8

77.8

68.7.2

71.4.6

67.2

71.4.6

66.4.7

66.4.7

66.4.6

66.4.4

66.4.6

66.4.6

66.4.6

66.4.6

66.4.6

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

66.4

6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AX046601
Sequence 1
AX046601
AX046601.1
                                                                                                                                                                                                                                                                Mahajan, P.B. and Shi, J. Rad51 from maize
                                                                                                                                                                                                                                                                                                                               Zea mays.
nays
Zea rayota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; Liliopsida; Poales; Poaceae; PACC clade;
                                                                                                                                                                                                                                                                                                Panicoideae; Andropogoneae;
1 (bases 1 to 1474)
                                                                                                                                                                                                                                   PIONEER HI-BRED
                                                                                                                                                                                                                    from maize
f: WO 0068370-A 1 16-NOV-2000;
t: WO 1018370-A 1 16-NOV-2000;
TER HI-BRED INTERNATIONAL, INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="unnamed protein product"
/codon_start=1
/codon_start=1
/protein_id="Cacl8901.1"
/protein_id="Cacl8901.1"
/db_xref="Gd:11876174"
/db_xref="Gd:11876174"
/translation="MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKHITTGSSDLND
/translation="MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKHITTGSSFDLND
/translation="MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKHITTGSSFDLND
/translation="MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKKNYITTGSSFDLND
/translation="MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKKHITTGSSFDLND
/translation="MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKKHITTGSSFDLND
/translation="MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKKHITTGSSFDLND
/translation="MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKKHITTGSSFDLND
/translation="MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKKHITTGSSGDLND
/translation="MGDQSGSRNGPQKYVSGAQNAWDMFSDELSQKKHITTGSSGDLND
/translation="MGDQSGSRNGPQKYVSGAQNAWDMFSDELSQKKHITTGSSGDLND
/translation="MGDQSGSTRUCKHITTGS"
/translation="MGDQSGSTRUCKHITTGS"
/translation="MGDQSGSTRUCKHITTGSGSTMV"
/translation="MGDQSGSTRUCKHITTGSGSTMV"
/translation="MGDQSGSTMV"
/transl
                                                                                                                                              /organism="Zea mays"
/db_xref="taxon:4577"
310...1194
                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              64044
1518
921
921
928
1101
1260
1502
923
971
147620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2340
122871
110000
10980
13968
1699
202000
1241
1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4230
15350
844
992
1030
1050
1551
1551
1551
1551
151
813
2745
1177
1219
1020
1020
1800
                                                                                                                                                                                                                                                                                                                                                                                                                                                 from
                                                                                                                                                                                                     .1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Patent WO0068370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                ďď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       75
72
75
12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3 ATH296174
2 AC002387
1 LMFLCHR32_17
AE001035
AE000901
SSU45310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AB026115
AB026115
AC066858
AC045789
AC0453814
AF145465
AF052597
AF052597
CNS066DD1
CNS0666DD1
CNS0666B0
AC011195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CAU39808
D64035
AB008545
SPAC8E11
AC029940
AC078693
AC078693
AF079428
AF079429
CNS07529
AF198107
AT143528
AF017122
AF017722
AF01772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AP000058
LEU22441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YSCPDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ALIGNMENTS
                                                                                                                                                                                                                                                                                                                   Zea.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AP000058 Aeropyrum
U22441 Lycopersico
U39808 Candida alb
D64035 Schizosacch
AB008545 Schizosacch
AB008545 Schizosacch
AB008545 Schizosacch
AB008545 Schizosacch
AB008545 Schizosacch
AB002940 Giardia i
AC029940 Giardia i
AC02893 Giardia i
AC02893 Giardia i
AC028893 Giardia i
AC078679 Giardia i
AF079429 Zea mays
AX047126 Sequence
AF079429 Zea mays
AL430524 Cione BA0
AF198107 Giardia i
U43528 Arabidopsis
AX047122 Sequence
AF017729 Oryctolag
M87549 Saccharomyc
D1085 Yeast genes
U18922 Saccharomyc
AB026115 Pyrobacul
AC045789 Giardia i
AC045789 Giardia i
AC045789 Giardia i
AC045789 Giardia i
AF0145465 Desulfuro
AF052597 Pyrococcu
AL411887 T7 end of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AE001035 Archaeog
AE000901 Methanob
U45310 Sulfolobus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AJ296174 Arabidops
AC002387 Arabidops
Continuation (18 o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Methanoba
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Archaeogl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      멍
                                               Qy
                                                                                      Вb
                                                                                                                ρ
                                                                                                                                                     밁
                                                                                                                                                                                  Q
                                                                                                                                                                                                                    Дb
                                                                                                                                                                                                                                               QY
                                                                                                                                                                                                                                                                                   뫄
                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Sim
Matches 1474;
                                                                                                                                                                                                                                                                                                                                                                                                                  541
                                                                                                                                                                                                                                                                                                                                                                                                                                                  541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                      901
                                                                                      841
                                                                                                                   841
                                                                                                                                                                                                                      721
                                                                                                                                                                                                                                                                                    661
                                                                                                                                                                                                                                                                                                                   661
                                                                                                                                                                                                                                                                                                                                                   601
                                                                                                                                                                                                                                                                                                                                                                                    601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                      901
                                                                                                                                                       781
                                                                                                                                                                                    781
                                                                                                                                                                                                                                                  721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cctaagcgacagcggcgtcgacgtaagcggctgcgtggcgccaccgacggaggctac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tcgacccacgcgtccgcacttgactcccagtctcccactgtgcgcagttcgcttggtccc
                    CACTTTCCGCACAGCCATGAGAAGTCCTCTTCTGTCCAAAAAACAATTACAGCCTGAGCGT
                                                                                                                                                                                                                                                                                                                                                agtttcatggttgaacgtgtctaccagattgctgaagggtgtattaggggcatactggag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggttctggtgacctcaatgacatacttggtggcgggattcactgcaaagaagttactgag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gcaatcaccatgggagatcaatctggctctagaaatggaccacaacagaagtacgtttca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GATACTGAAATCCGCACTGCAGTTCTCTTCTTCCCCCAATCAGTACCACCTCTCCAAGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TCGACCCACGCGTCCGCACTTGACTCCCCAGTCTCCCCACTGCGCAGTTCGCTTGGTCCC
                                                                                   cactttccgcacagccatgagaagtcctcttctgtccaaaaacaattacagcctgagcgt
                                                                                                                                                                                                                                                                                                                                                                                                                  caaatcccagtggaatgtggtggccttggtgggaaagcagtttatatagatacagagggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gatactgaaatccgcactgcagttctctttcttcccccaatcagtaccacctctccaagtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCAATCACCATGGGAGATCAATCTGGCTCTAGAAATGGACCACAACAGAAGTACGTTTCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      415 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKGIRDAVSSNHKRARVT"
337 c 369 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 1474;
Pred. No. 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
```

```
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                             VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
AX046605
          BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Б
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                         DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                      LOCUS
                                                                                                                                                                                                                                                    JOURNAL
                                                                                                                                                                                                                                                                                                                                                    ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1381
                                                                                                                                                                  CDS
                                                                                                                                                                                                            source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             961
                                                                                                                                                                                                                                                                                                                                                                                                                                                               N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcgggcaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ggactagtgaggtgagactggagaatagtaccattttgttgattctcagttgctttgtgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tggtgtcaagcacttgtatgtccactacgctcctgcagctttcttcgccatggatctttt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aaagggattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TTTTGTATCTGAACATCTGGCCCATCGTACATTCAGTAAAGCCTATAATAGCGGGCAAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TGGTGTCAAGCACTTGTATGTCCACTACGCTCCTGCAGCTTTCTTCGCCATGGATCTTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGTTGGCTACCAACCAACCTTAAGAGAGAAGTAAATACAACAGAACAGGCTAATATAGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGACTAGTGAGGTGAGACTGGAGAATAGTACCATTTTGTTGATTCTCAGTTGCTTTGTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAAGGGATTAGAGATGCTGTGAGCTCAAACCACAAGCGAGCCCGAGTAACGTAGCATTCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AACCAAGTCACTAAATTTACAGAAGGGTCATTTCAATTGACTCTTGCTCTAGGTGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aaccaagtcactactaaatttacagaagggtcatttcaattgactcttgctctaggtgac
                                                                                                                                                                                                                                                                                                                                                                                                         AX046605
Sequence
AX046605
                                                                                                                                                                                                                                                              Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; PACC clad Panicoideae; Andropogoneae; Zea.

1 (bases 1 to 1333)
Mahajan, P.B. and Shi, J.

Rad51 from maize
                                                                                                                                                                                                                                     PIONEER
                                                                                                                                                                                                                                                                                                                                                   Zea
                                                                                                                                                                                                                                                                                                                                                                 Zea
                                                                                                                                                                                                                                                                                                                                                                                             AX046605
                                                                                                                                                                                                                                                                                                                                                   mays
                                                                                                                                                                                                                                  WO 0068370-A 5 16-NOV-2000; HI-BRED INTERNATIONAL, INC.
           ρ
                                                                                                                                                                                                                                                                                                                                                                                             <u>.</u>
                                                                                                                                                                                                                                                                                                                                                                                                                       5
          GKGIRDAVSSNHKRARVT"
1 284 c 326 g
                                   /protein_id="CAC18903.1"
/db_xref="G1:11876178"
/db_xref="G1:11876178"
/translation="MGDOSGSENGPOOKYVSGAQNAWDMFSDELSQKHITTGSGDLND
ILGGGIHCKEVTEIGGVPGVGKTOLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVE
RYVQIABGCIROLLEHFPHSHEKSSSVOKQLOPERFLADIYYFRICSYTEQIAVINYM
EKFLREHKDVRIVIIOSYTEHFRODFEDLALFRYNLSGLSLKLMKIAKTYNLAVVLN
CVTTKFTEGSFQLTLALGDSWSHSCTNRLILHWNGNERYAHLDKSPSLFVASAPYAVT
                                                                                                                                                               /organism="Zea mays"
/db_xref="taxon:4577"
169. .1053
                                                                                                                                                                                                         Location/Qualifiers
1. .1333
                                                                                                                                                /note="unnamed protein product"
                                                                                                                                     /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                      1333 bp DNA from Patent WO0068370.
           345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1474
          đ
                                                                                                                                                                                                                                     (US)
                                                                                                                                                                                                                                                                                                                                                                                                                                     PAT
          others
                                                                                                                                                                                                                                                                                                                     yta; Spermatophyta;
clade;
                                                                                                                                                                                                                                                                                                                                                                                                                                     15-DEC-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1020
```

```
SQ.
                       Ъ
                                        δÃ
                                                                   망
                                                                                      Q
                                                                                                               밁
                                                                                                                                 Qy
                                                                                                                                                         멍
                                                                                                                                                                              Qy
                                                                                                                                                                                                      밁
                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                             뭥
                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches 1315;
                                             1102
                                                                                         1042
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                        961
                                                                   901
                                                                                                               841
                                                                                                                                    982
                                                                                                                                                           781
                                                                                                                                                                                922
                                                                                                                                                                                                      721
                                                                                                                                                                                                                            862
                                                                                                                                                                                                                                                  661
                                                                                                                                                                                                                                                                        802
                                                                                                                                                                                                                                                                                              601
                                                                                                                                                                                                                                                                                                                  742
                                                                                                                                                                                                                                                                                                                                          541
                                                                                                                                                                                                                                                                                                                                                              682
                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                           622
                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                      562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -ب
                      aaccggttgattctgcactggaatgggaacgatacgcacatcttgataagtctcct
                                                                                                                         acagaagggtcatttcaattgactcttgctctaggtgacagctggtcccactcatgcacg
                                                                                                                                                                                                                 gattttgaagatctggcactgaggaccagagtgctaagtggaattatcattgaagttaatg
                                                                                                                                                                                                                                                                                            cgacgtaagcggctgcgtggcgccaccgacggaggctacgagcggttgtggaggcagata
agctcaaaccacaagcgagcccgagtaacgtagcattcttggtgtcaagcacttgtatgt
                                                                   AACCGGTTGATTCTGCACTGGAATGGGAACGAACGATACGCACATCTTGATAAGTCTCCT
                                                                                                                                                                      aagattgcaaagacatataacttggcagttgtcttgttgaaccaagtcactactaaattt
                                                                                                                                                                                                      GATTTTGAAGATCTGGCACTGAGGACCAGAGTGCTAAGTGGATTATCATTGAAGTTAATG
                                                                                                                                                                                                                                                              agagagcataaagatgtgcgtatagttattattgatagtgttactttccactttcgacaa
                                                                                                                                                                                                                                                                                                                                                   aagtcctcttctgtccaaaaacaattacagcctgagcgtttcctggcggatatctattac
                                                                                                                                                                                                                                                                                                                                                                                                taccagattgctgaagggtgtattagggacatactggagcactttccgcacagccatgag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ggtaaaactcaactggggattcaactagcaatcaatgtacaaatccccagtggaatgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  atacttggtggcgggattcactgcaaagtaagttactgagatcggtggcgtcccaggggtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             atgttctctgatgagctgtcacagaaacacatcactactggttcttggtgacctcaatgac
                                                                                                               ACAGAAGGGTCATTTCAATTGACTCTTGCTCTAGGTGACAGCTGGTCCCCACTCATGCACG
                                                                                                                                                            AAGATTGCAAAGACATATAACTTGGCAGTTGTCTTGTTGAACCAAGTCACTACTAAATTT
                                                                                                                                                                                                                                                  AGAGAGCATAAAGATGTGCGTATAGTTATTATTGATAGTGTTACTTTCCACTTTCGACAA
                                                                                                                                                                                                                                                                                                                                          AAGTCCTCTTCTGTCCAAAAACAATTACAGCCTGAGCGTTTCCTGGCGGATATCTATTAC
                                                                                                                                                                                                                                                                                                                                                                                     TACCAGATTGCTGAAGGGTGTATTAGGGACATACTGGAGCACTTTCCGCACAGCCATGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GGTAAAACTCAACTGGGGATTCAACTAGCAATCAATGTACAAATCCCAGTGGAATGTGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATACTTGGTGGCGGGATTCACTGCAAAGAAGTTACTGAGATCGGTGGCGTCCCAGGGGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATGTTCTCTGATGAGCTGTCACAGAAACACATCACTACTGGTTCTGGTGACCTCAATGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TGAGAGGTGGAGGTGCCTACAACGGGTCGGCGGCTGTGAGATACTGAAATCCGCACTGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tgagaggtggaggtggctacaacgggtcggcggctgtgagatactgaaatccgcactgca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CGACGTAAGCGGCTGCGTGGCGCCACCGACGGAGGCTACGAGCGGTTGTGGAGGCAGATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 멂
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1333;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                            1161
                                                                                                                                   1041
                       1020
                                                                   960
                                                                                                                                                           840
                                                                                                                                                                                981
                                                                                                                                                                                                      780
                                                                                                                                                                                                                           921
                                                                                                                                                                                                                                                  720
                                                                                                                                                                                                                                                                       861
                                                                                                                                                                                                                                                                                            660
                                                                                                                                                                                                                                                                                                                  801
                                                                                                                                                                                                                                                                                                                                          600
                                                                                                                                                                                                                                                                                                                                                             741
                                                                                                                                                                                                                                                                                                                                                                                   540
                                                                                                                                                                                                                                                                                                                                                                                                          681
                                                                                                                                                                                                                                                                                                                                                                                                                                                     621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      44]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    201
```

```
REFERENCE
AUTHORS
TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT
AX046603
LOCUS
                                                                                                                                                           BASE CONTIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                            SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ωy
                                     ρŅ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
Qy
                     밁
                                                             B
                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                 KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                            VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DEFINITION
                                                                                                                Query Match
Best Local Similarity
                                                                                                        Matches 1286;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1321
                                                                                                                                                                     COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1021
                                                                                                                                                                                                                                                                                                                       source
  262
                                          202
                      61
                                                                         cgacgtaagcggctgcgtggcgccaccgacggaggctacgagcggttgttgggaggcagata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aaaaaaaaaaaaa 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gttctcttcttcccccaatcagtaccacctctccaagtggcaatcaccatgggagatcaa
                                                               CGACGTAAGCGGCTGCGTGGCGCCACCGACGGAGGCTACGAGCGGTTGTGGAGGCAGATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCATCGTACATTCAGTAAAAGCCTATAATAGCGGGCATATATGTGCTTCTCTGATCAAAAA 1320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aagagagaagtaaatacaacagaacaggctaatatagtgtttttgtatctgaacatctggc 1401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CCACTACGCTCCTGCTTCTTCGCCATGGATCTTTTGGACTAGTGAGGTGAGACTGG
                                 tgagaggtggaggtggctacaacgggtcggctgtgagatactgaaaatccgcactgca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAAAAAAAAAAA 1333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAGAGAAGTAAATACAACAGAACAGGCTAATATAGTGTTTTGTATCTGAACATCTGGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
AX046603
                                                                                                                                                                                                                                                                                                                                                            Mahajan, P.B.
Rad51 from ma
                                                                                                                                                                                                                                                                                                                                                                                 Panicoideae; Andropogoneae;
1 (bases 1 to 1459)
                                                                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; Liliopsida; Poales; Poaceae; PACC clade;
                                                                                                                                                                                                                                                                                                                                                                                                                            Zea
                                                                                                                                                                                                                                                                                                                                                                                                                                      Zea
                                                                                                                                                                                                                                                                                                                                                                                                                                                           AX046603.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AX046603
                                                                                                                                                                                                                                                                                                                                                     Patent:
                                                                                                                                                                                                                                                                                                                                                                                                                            mays
                                                                                                                                                                     504
                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                      from maize
t: WO 0068370-A 3 16-NOV-2000;
ER HI-BRED INTERNATIONAL, INC.
                                                                                                                                                                     D
                                                                                                                                                                                       /translation="MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKHITTGSGDLND
ILGGGIHCKEVTEIGGVPGVGKTQLGIOLAINVQIPVECGGLGGAVILWGSFWVERV
YQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVILWAEK
ELREHKDYRIVIIDSVTFHFRQDFEDLALRTRVLSGLSLKLMKLAKTYNLAVVLLNQV
TTKFTEGSFQLTLALGDSWSHSCTNRLILHWNGNERVAHLDKSPSLPVASAPYAVTGK
                                                                                                                                                                                                                                                                                      /organism="Zea mays"
/db_xref="taxon:4577"
169. .1014
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ω
                                                                                                                                                                               GIRDY"
                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                             /protein_id="CAC18902.1"
/db_xref="GI:11876176"
                                                                                                                                                                                                                                                                            /note="unnamed protein
                                                                                                                                                                                                                                                                   /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 from
                                                                                                                                                                                                                                                                                                                                                                       and Shi, J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1459 bp
                                                                                                                 84.3%;
98.9%;
                                                                                                                                                                     288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Patent WO0068370.
                                                                                                                                                                     O
                                                                                                       0;
                                                                                                       Score 1243.2; DB 9;
Pred. No. 8.1e-290;
0; Mismatches 3;
                                                                                                                                                                    ģ
                                                                                                                                                                                                                                                                                                                                                                                                Zea.
                                                                                                                                                                     341 t
                                                                                                                                                                                                                                                                            product"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PAT
                                                                                                        Indels
                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15-DEC-2000
                                                                                                        11;
                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1080
                       120
                                           261
                                                               60
                                                                                   201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1200
  321
                                                                                                        Ψ
           Ωy
                                                   δã
                                                                         밁
                                                                                            20
                                                                                                                   B
                                                                                                                                    Ωy
                                                                                                                                                           В
                                                                                                                                                                              δÃ
                                                                                                                                                                                                      В
                                                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                          ρy
                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                B
             1342
                                 1134
                                                     1282
                                                                          1074
                                                                                              1222
                                                                                                                   1014
                                                                                                                                       1162
                                                                                                                                                                                  1102
                                                                                                                                                                                                                           1042
                                                                                                                                                            955
                                                                                                                                                                                                      895
                                                                                                                                                                                                                                               835
                                                                                                                                                                                                                                                                                                             922
                                                                                                                                                                                                                                                                                                                                                                                              802
                                                                                                                                                                                                                                                                                                                                                                                                                    595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 682
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                   982
                                                                                                                                                                                                                                                                                        775
                                                                                                                                                                                                                                                                                                                                  715
                                                                                                                                                                                                                                                                                                                                                      862
                                                                                                                                                                                                                                                                                                                                                                          655
                                                                                                                                                                                                                                                                                                                                                                                                                                        742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                382
                                                                                                                                                                                                     aagagagaagtaaatacaacagaacaggctaatatagtgttttgtatctgaacatctggc
                                                                                                                                                          acagaagggtcatttcaattgactcttgctctaggtgacagctggtcccactcatgcacg
                                                                                                                                                                                                                                                                                        AAGATTGCAAAGACATATAACTTGGCAGTTGTCTTGTTGAACCAAGTCACTACTAAATTT
                                                                                                                                                                                                                                                                                                   aagattgcaaagacatataacttggcagttgtcttgttgaaccaagtcactactaaattt
                                                                                                                                                                                                                                                                                                                                  GATTTTGAAGATCTGGCACTGAGGACCAGAGTGCTAAGTGGATTATCATTGAAGTTAATG
                                                                                                                                                                                                                                                                                                                                            gattttgaagatctggcactgaggaccagagtgctaagtggattatcattgaagttaatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAGTCCTCTTCTGTCCAAAAACAATTACAGCCTGAGCGTTTCCTGGCGGATATCTATTAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aagtcctcttctgtccaaaaacaattacagcctgagcgtttcctggcggatatctattac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TACCAGATTGCTGAAGGGTGTATTAGGGACATACTGGAGCACTTTCCGCACAGCCATGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                taccagattgctgaagggtgtattagggacatactggagcactttccgcacagccatgag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TCTGGCTCTAGAAATGGACCACAACAGAAGTACGTTTCAGGAGCCCAGAATGCCTGGGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tctggctctagaaatggaccacaacagaagtacgtttcaggaagcccagaatgcctgggat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccactacgctcctgcagctttcttcgccatggatcttttggactagtgaggtgagactgg
                                                                                                                   AGCTCAAACCACAAGCGAGCCCGAGTAACGTAGCATTCTTGGTGTCAAGCACTTGTATGT
                                                                                                                              agctcaaaccacaagcgagcccgagtaacgtagcattcttggtgtcaagcacttgtatgt 1221
                                 CCACTACGCTCCTGCAGCTTTCTTCGCCATGGATCTTTTGGACTAGTGAGGTGAGACTGG
                                                                                                                                                                                                                                                ACAGAAGGGTCATTTCAATTGACTCTTGCTCTAGGTGACAGCTGGTCCCACTCATGCACG
                                                                                                                    1073
                                                                                                                                                              1013
                                                                                                                                                                                  1161
                                                                                                                                                                                                                                                                     1041
              1401
                                                                                                                                                                                                                                                                                                                                                                                                861
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                           1133
                                                                                                                                                                                                                                                                                          834
                                                                                                                                                                                                                                                                                                              981
                                                                                                                                                                                                                                                                                                                                                                          714
                                                                                                                                                                                                                                                                                                                                                                                                                                         801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                894
                                                                                                                                                                                                                                                                                                                                   774
                                                                                                                                                                                                                                                                                                                                                      921
                                                                                                                                                                                                                                                                                                                                                                                                                     654
                                                                                                                                                                                                                                                                                                                                                                                                                                                              594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       501
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                       Qy
                                                                                   δð.
                                                                                                                      밁
                                                                                                                                                                                          B
                                                                                                                                                                                                                           Ω
                                                                                                                                                                                                                                                                                                                                                   ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ATH299424
                δã
                                                     밁
                                                                                                                                                                                                                                                                                                                                                                      BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ORGANISM
                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          source
                    541
                                                       382
                                                                                      481
                                                                                                                         322
                                                                                                                                                         421
                                                                                                                                                                                            262
                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                               Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAGAGAGAAGTAAATACAACAGAACAGGCTAATATAGTGTTTTGTATCTGAACATCTGGC 1249
caaatcccagtggaatgtggtggccttggtgggaaagcagtttatatagatacagagggc 600
                                                                       ggttctggtgacctcaatgacatacttggtggcgggattcactgcaaagaagttactgag 480
                                                                                                                                                                                          GGAGCAAAGAACGCTTGGGATATGCTTCACGAGGAGGAGTCTTTGCCGCGTATTACTACA 321
                                                                                                                                                                                                                ggagcccagaatgcctgggatatgttctctgatgagctgtcaccagaaacacatcactact 420
                                                                                                                         TCTTGCTCTGATCTTGATAACATTTTGGGCGGTGGAATTAGCTGTAGGGATGTTACAGAG
                                                       ATTGGTGGGGTACCAGGGATTGGCAAGACTCAGATTGGGATCCAGCTCTCTGTGAATGTT 441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Submitted (18-OCT-2000) Siaud N., Reparation/Recombinaison chez Arabidopsis, Institut de Biotechnologie des Plantes, E 630, Universite Paris XI 91405 Orsay Cedex, FRANCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Siaud
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AJ299424
AJ299424.1 GI:10944744
RAD51C gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATH299424 1101 bp mRNA PLN Arabidopsis thaliana mRNA for RAD51C protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Siaud, N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Brassicales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               thale cress.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (bases 1 to 1101)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (bases 1 to 1101)
                                                                                                                                                                                                                                                                                                                                                                         307
                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                         D
                                                                                                                                                                                                                                                                                                                                                                    AKKFSLAVVLLNQVTTKFSEGSFQLALALGDSWSHSCTNRVILYWNGDERYAYIDKSP
SLPSASASYTVTSRGLRNSSSSSKRVKMM"
1 219 c 268 g 307 t
                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="MISFGRRKSPAIEETSLATSVMEAWRLPLSPSIRGKLISAGYTC LSSIASVSSSDLARDAWITEEEAFEILKLANGSCONGSRSLINGAKNAWDMLHEEESL PRITTSCSDLDNILGGGISCRDVTEIGGVPGIKTQIGIOLSVNVQIPRECGGLGKA IYIDTEGSFMVKRALQIAEACVEDMEEYTGYMIKHFQARGVQMKPEDILENIFYFRVC SYTEQIALVNHLEKFISENKDVKVVIVDSITFHFRQDYDDLAQRTRVLSEMALKFMKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="RAD51C protein"
/protein_id="CAC14091.1"
/db_xref="GI:10944745"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           organism="Arabidopsis thaliana"
/cultivar="Columbia"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /evidence=experimental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="RAD51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     'gene="RAD51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /db_xref="taxon:3702"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 'function="recombination factor"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        'chromosome="II"
                                                                                                                                                                                                                                                                                 24.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                 Score 358.8; D
Pred. No. 3.8e-
                                                                                                                                                                                                                                                                    Mismatches 272;
                                                                                                                                                                                                                                                                                                 DB 13; Length 1101;
                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20-OCT-2000
                                                                                                                                                                                                                                                                  0
                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Batiment
                                                                                                                           381
                                                                                                                                                                                                                                                                    0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                         VERSION
KEYWORDS
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          β
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                            REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                     REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
                                                                                                            FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                              DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Locus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AF029669
                                                                                                                                                                                                                JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                              JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1021
                                                                                        source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1042 AGAGGTCTAAGAAA 1055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              922
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    862
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        802
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 682
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cactttccgcacagccatgagaagtcctcttctgtccaaaaacaattacagcctgagcgt 720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gttactttccactttcgacaagattttgaagatctggcactgaggaccagagtgctaagt 900
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aactacatggagaagttcctcagagaggcataaagatgtgcgtatagttafttattgatagt 840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aaagggattagaga 1154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gcacatcttgataagtctccttcacttccagtagcctcagcaccgtatgcagtgacaggc 1140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aaccaagtcactactaaatttacagaagggtcatttcaattgactcttgctctaggtgac 1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GAAATGGCTTTAAAGTTCATGAAGCTTGCCAAAAAGTTCTCACTTGCGGTCGTGTTACTA 861
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ggattatcattgaagttaatgaagattgcaaagacatataacttggcagttgtcttgttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATCACCTTTCATTTCCGTCAGGACTATGATGACTTAGCCCAGAGGACACGAGTGCTCAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AATCATCTTGAAAAGTTCATCTCTGAAAACAAAGATGTTAAAGTTGTAATCGTAGACAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TACACAGGATACATGCATAAACATTTTCAAGCAAATCAAGTACAAATGAAACCAGAAGAT 621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AGCTTCATGGTGAAGCGTGCTTTACAGATAGCAGAAGCTTGTGTAGAGGACATGGAAGAA 561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           agtttcatggttgaacgtgtctaccagattgctgaagggtgtattagggacatactggag 660
                                                                                                                                                                                                                                                                                                                                                                                                                  1295 bp

4 Homo sapiens Rad51C (R

AF029669

AF029669.1 GI:2909800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GCATATATCGATAAGTCCCCTTCACTTCCTTCAGCTTCGGCTTCATACACTGTAACCAGT 1041
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AGCTGGTCTCATTCGTGCACCAACCGAGTCATTCTGTATTGGAATGGTGATGAGCGTTAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (09-OCT-1997) Life Sciences, Laboratory, Ms. 70A-1118, Berkeley, CA
                                                                                                                                                            Schild,D., Collins,D.W. and Dosanjh,M.K.
Direct Submission
                                                                                                                                                                                                                                                                                                     1 (bases 1 to 1295)
Dosanjh,M.K., Collins,D.W., Fan,W., Lennon,G.G., Albala,J.S.,
                                                                                                                                                                                                                                                                                                                                      Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                 Isolation and characterization of RAD51C, a RAD51 family of related genes
                                                                                                                                                                                                                                                                                                                                                                             Homo sapiens
                                                                                                                                                                                                                  98136197
                                                                                                                                                                                                                                                                                      Shen, Z. and Schild, D.
                                                                                                                                                                                                                                                                                                                                                                                              human
                                                                                                                                                                                               (bases 1 to 1295)
                                                                                                                                                                                                                                 eic Acids
       /map="17g; 413.6cR from the top"
/cell_type="leukocyte (mixed pop
                                        /chromosome="17"
                                                         /organism="Homo sapiens"
/db_xref="taxon:9606"
                                                                                                           ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                               GI:2909800
                                                                                                                                                                                                                                    Res. 26 (5), 1179-1184 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                              p mRNA PRI
(RAD51C) mRNA, complete cds
                                                                                                                               es, Lawrence Berkeley National CA 94720, USA
         population)"
```

960 801 741

member of the

```
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BASE COUNT
     1109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                             920
                                                                                                                                                                                   860
                                                                                                                                                989
                                                                                                                                                                                                                   929
                                                                                                                                                                                                                                                        800
                                                                                                                                                                                                                                                                                         869
                                                                                                                                                                                                                                                                                                                            740
                                                                                                                                                                                                                                                                                                                                                                                               089
                                                                                                                                                                                                                                                                                                                                                                                                                                749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    689
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              320 AGGAGCATACCCAGGGCTTCATAATCACCTTCTGTTCAGCACTAGATGATATTCTTGGGG 379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local
cagtagcctcagcaccgtatgcagtgacaggcaaagggattagagatgctgt 1160
                                    tgattctgcactggaatgggaacgaacgatacgcacatcttgataagtctccttcacttc 1108
                                                                                                         ATCAGGCCTTGCTTCTTCCTGCATTAGGGGAAAGTTGGGGAACATGCTGCTACAATACGGC
                                                                                                                            ggtcatttcaattgactcttgctctaggttgacagcttggtcccactcattgcacgaaccggt 1048
                                                                                                                                                                               CAAATAATCACAGATTAGCTGTAATTTTAACCAATCAGATGACAACAAAGATTGATAGAA
                                                                                                                                                                                                                                                                        aagatctggcactgaggaccagagtgctaagtggattatcattgaagttaatgaagattg
                                                                                                                                                                                                                                                                                                                                          ataaagatgtgcgtatagttattattgatagtgttactttccactttcgacaagattttg
                                                                                                                                                                                                                                                                                                                                                                                            GTCGTGACTACACAGAGTTACTGGCACAAGTTTATCTTCCTGCAGATTTCCTTTCAGAAC
                                                                                                                                                                                                                                                                                                                                                                                                                         tatgcagttacaccgaacaaattgcagtcataaactacatggagaagttcctcagagagc 808
                                                                                                                                                                                                                                                                                                                                                                                                                                                               cttctgtccaaaaacaattacagcctgagcgtttcctggcggatatctattacttccgga 748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggtggccttggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                atgagetgtcacagaaacacatcactactggttctggtgacctcaatgacatacttggtg 451
                                                                                                                                                                                                                caaagacatataacttggcagttgtcttgttgaaccaagtcactactaaatttacagaag
                                                                                                                                                                                                                                                    ATGACCTGTCTTCGTACTCGGTTATTAAATGGCCTAGCCCAGCAAATGATCAGCCTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CTACTGCCTGCATTCAGCATCAGCTTATAGCAGAAAAACACAAGGGAGGAACACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ctgaagggtgtattagggacat---actggagcactttccgcacagccatgagaagtcct 688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTGGAGTGCCCTTAATGAAAACAACAGAAATTTGTGGTGCACCAGGTGTTGGAAAAAACAC 439
                                                                                                                                                                                                                                                                                                                        ACTCAAAGGTTCGACTAGTGATAGTGGATGGTATTGCTTTTCCATTTCGTCATGACCTAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AATTATGTATGCAGTTGGCAGTAGATGTGCAGATACCAGAATGTTTTGGAGGAGTGGCAG 499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     408;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EGSFMUDRVUDLATACIQHLQLIAEKHIKGEEHRKALEDFTLDNILSHIYYFRCRDYTE
LLAQVYLLPDFLSEHSKVRLVIVDGIAFPFRHDLDDLSLFRTRLINGLAQQMISLANNH
RLAVILJNQMTKIDRNQALLVPALCESWGHAATIRLIFHDBKQRLATLYKSPSQKE
CTVLFQIKPQGFRDTTVTSACSLQTEGSLSTRKRSRDPEEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="MRGKTFRFEMQRDLVSFPLSPAVRVKLVSAGFQTAEELLEVKPS
ELSKEVGISKAEALETLQIIRRECLTNKPRYAGTSESHKKCTALELLEQEHTQGFIIT
FCSALDDILGGGVPLMKTTEIGGAPGVGKTOLCMQLAVDVQIPECFGGVAGEAVFIDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="RAD51C"
43. .1173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="Rad51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="member of the Rad51 family of related
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="RAD51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /protein_id="AAC39604.1"
/db_xref="GI:2909801"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12.1%; 52.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 178.4; DB 8
Pred. No. 1.5e-32;
0; Mismatches 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       308 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         346 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                proteins"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                            739
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 679
                                                                                                                                                                                                                                                                                                                        799
                                                                                                                                                                                                                                                                                                                                                         868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           571
              Ş
                                                    밁
                                                                                    δõ
                                                                                                                        밁
                                                                                                                                                         Qγ
                                                                                                                                                                                               멍
                                                                                                                                                                                                                              γ
                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ACCESSION
VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                              ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AP003310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LOCUS
                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM
                                                                                                                          2279
                                                                                                                                                                                                                                                                                                                                                                                                                                             COUNT
                                                                                                                                                             701
                                                                                                                                                                                                                                  641
```

δã В δÃ В ρy В Ş 밁 В

Q 밁

δÃ

δÃ

밁 Ş Дb γQ ₽ δÃ 멍 Š 밁 Ş 밁

```
Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                               source
                                                                                                                                                                                                                                                                                 2219 GCATCAGTGATATACTGGAGTACTTTCCACACTGCCATGACAAGGCTCCAGCCGGACAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1040 AGGAATGCACAGTACTGTTTCAAATCAAACCTCAGGGATTTAGAGATACTGT 1091
gtatagttattattgatagtgttactttccacttt
                                                                         CTGAACAAATTGCAGTCATAAACTATCTGGAAAAGTTTCTTGGGGAGCATAAAGATGTAA 2398
                                                                                                                                                                                                    aacaattacagcctgagcgtttcctggcggatatctattacttccggatatgcagttaca 760
                                                                                                                                                                                                                                                                                                             gtattagggacatactggagcactttccgcacagccatgagaagtcctcttctgtccaaa 700
                                                                                                   AAAAACTGAAGCCTGAGAGTTTCCTGGCTGACATCTACTACTTCGAATATGCAGCTATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     210;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Agrobiological Resources, Rice Genome Research Program; Kannondai 2-1-2, Tsukuba, Ibaraki 305-8602, Japan (E-mail:tsasaki@abr.affrc.go.jp, URL:http://rgp.dna.affrc.go.jp/, Tel:81-298-38-7441, Fax:81-298-38-7468)

NOTE: It currently consists of 1 contigs. Gaps between the contigs are represented as runs of N. The order of the pieces is believed to be correct as given, however the sizes of the gaps between them are based on estimates that have provided by the submitter. This sequence will be replaced by the finished sequence as soon as it is available and the accession number will be preserved.

* This sequence will be replaced

* This sequence will be replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Submitted (21-FEB-2001) Takuji Sasaki, National Institute of Agrobiological Resources, Rice Genome Research Program; Kannondai
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sasaki,T., Matsumoto,T. and Yamamoto,K. Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Oryza sativa nipponbare(GA3) genomic DNA, clone:P0022F12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Oryza sativa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AP003310 139652 bp DNA H
Oryza sativa chromosome 1 clone P0022F12,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sasaki, T., Matsumoto, T. and Yamamoto, K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Ehrhartoideae; Oryzeae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Oryza sativa (cultivar:Nipponbare) DNA, clone:P0022F12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Published Only in DataBase (2001) In press
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HTG; HTGS_PHASE2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AP003310.1 GI:13094242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AP003310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROGRESS ***, in ordered pieces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AP003310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     by the finished sequence as soon as it is available the accession number will be preserved.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           38780 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (bases 1 to 139652)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (sites)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="taxon:4530"
/chromosome="1"
/clone="p0022F12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /organism="Oryza sativa"
/cultivar="Nipponbare"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1. .139652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        30243 c 29934 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 171; DB 83;
Pred. No. 1.2e-30;
0; Mismatches 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           40445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (+
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        250 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 139652;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22-FEB-2001
SEQUENCING IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0,:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                             2338
                                                                                                                                                                                                                                                                                   2278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
```

.20751)

```
JOURNAL REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AP002908/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gene
                                                                                                                          gene
                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2399 TTTTCTTGAACAATTTAGTCTTGAATTATTAGTTT 2433
                                                              misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2-1-2, Tsukuba, Ibaraki 305-8602, Japan
(E-mail:tsasaki@abs.affrc.go.jp, URL:http://rgp.dna.affrc.go.jp/,
Tel:81-298-38-7441, Fax:81-298-38-7468)
On Feb 28, 2001 this sequence version replaced gi:11136550.
Genes were predicted from the integrated results of the following:
GENSCANI.0, BLASTN2.0, BLASTN2.0 as well as SplicePredictor
(October 1998 version). The genomic sequence was searched against
NCBI NonRedundant protein database, nr
(ftp://ncbi.nlm.nih.gov/blast/db) and the cDNA sequence database at
RGP. Protein homologies of the coding regions were searched against
NCBI NonRedundant protein database with BLASTN2.0. ESTs represent
the identified cDNA sequences using BLASTN 2.0 with the
corresponding DBBJ accession no. and RGP clone ID.
A gene with identity or significant homology to a protein is
classified based on the protein name to indicate the homology level
such as same name, 'putative-' and '-like protein'. A gene without
significant homology to any protein but with EST homology (covering
almost the entire length of partial sequence) is classified as an
'unknown' protein. A gene predicted with a gene prediction program
is classified as a 'hypothetical' protein.
The orientation of the sequence is from T7 to SP6 of the PAC clone.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AP002908
Oryza sat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              http://rgp.dna.affrc.go.jp/GenomeSeq.html.
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Detailed information on overlap and assembly quality together with annotation of this entry is available at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Agrobiological Resources, Rice Genome Research Program; Kannondai
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (08-NOV-2000) Takuji Sasaki, National Institute of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sasaki,T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Published Only in DataBase (2000) In press
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Oryza sativa nipponbare(GA3) genomic DNA, chromosome 1, PAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sasaki, T., Matsumoto, T. and Yamamoto, K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Ehrhartoideae; Oryzeae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Oryza sativa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AP002908.2 GI:13161334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 1 to 163419)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sativa (cultivar:Nipponbare) DNA, clone:P0013G02
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sativa genomic DNA, chromosome 1,
                                                                                                                                                                                                                                                                                                                                                                                      complement(join(2332. .2436,2786. .2871,3194.
/gene="p0013G02.1"
complement(join(2332. .2436,2786. .2871,3194.
/gene="p0013G02.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                , Matsumoto, T. and Yamamoto, K.
                            complement(9637. .12886)
/gene="P0013G02.2"
                                                                                        complement(9637. .12886)
/gene="P0013G02.2"
                                                                                                                                                       complement(8102. .9679)
/note="3' LTR"
                                                                                                                                                                                                            /protein_id="BAB32926.1"
/db_xref="GI:13161335"
/translation="MDLAKCYYTSPPTRCGEGEDSSLWELEMRRMWRRGGLLPVGVGD
EEEKKPGRTASVLEGVNRHI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /cultivar="Nipponbare"
/db_xref="taxon:4530"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /organism="Oryza sativa"
/note="probably inactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /clone="P0013G02"
                                                                                                                                                                                                                                                                                                                                    /codon_start=]
                                                                                                                                                                                                                                                                                                                                                             'note="hypothetical protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'chromosome="
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        163419 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .163419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA
   due to stop codon(s) in CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PAC clone:P0013G02.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .3197))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
         CDS
                                                                                                                          gene
                         complement(join(47103...47281,4901050114...50340,50420...50490,50561.51241...51345,51594...51705))
/gene="P0013G02.7"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /protein_id="BAB32929.1"
/db_xref="GI:13161338"
/db_xref="GI:13161338"
/translation="MTLEPRGGREWRRCSGGWETTMPAAEYVPECGATREGGRGTARQ
GIDALDCGDGGSNHGDDSGRLLLALHAAGLALEPLPSTTSPAAAPCYFFVCV"
GIDALDCGDGGSNHGDDSGRLLLA.HAAGLALEPLPSTTSPAAAPCYFFVCV"
Gomplement(join(31561 .32021,32574 .33461,33560 .33820,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /protein_id="BAB32927.1"
/db_xref="GI:13161336"
/translation="MSWHSAGVLLLGAQSCLPILEVPAMAGSVNRHGLDLCGFVLELR
GMCIVLGYPHGVDYQGKKLPEQDGDDAEPHAANEVTAVILTGSPERTSLAVTAGGDSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(15279. .16871)
/note="5' LTR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(join(13135. .13944,14966. .15037))
/gene="P0013G02.3"
                                                                                                                                                                                                                                        LSWYRWRKORVVAGSPAAVGGRCSTDAAGKDSFRKSASSTLVSLEYSNGWDPLADGRG
GIGFSGEVAQSFRENNEDVESATOYFSELNILGKNGNFAATYRGTLRDCTSVVVKRLG
KTCCKQEBAEFLKGLKLLABLOHENTYGLCRFCCSRARGEFLVYDFV WRGSLSOFD
IDADDVARSNGRVLEWSTRISIIRGIAKGIEYLHSTRANKPPLVHQNISADKVLVDYT
                                                                                                                                                                                                                                                                                                                                                             QLTGGVPTQLGLLKRLTVLELQSNHLSGAIPASLGDLPQLVRLDLSFNNLFGSIPVRL
ALLPRLLALDVRNNTLTGSVPSELAKLQGGFQYANNTDLCGTGLPALRPCTPADLISP
DMPQPFSAGISPQITPGSSSDGHGHCTGTHCPPSTKALAAVVVVAVILLAVTGAGMFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELDKEAVAGGEAAQRLLKKYVGGGGAWMNRAAGSCSIKNHVMSERRRREKLNEMFLI
LKSLVPSIDKVDKASILSETIAYLKELERRVQELESGKKVSRPAKRKPCSETIIGGGG
GGGGAGAVKEHHHWVLSESQEGTPSDVRVIVMDKDELHLEVQCRWKELMMTRVFDAIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EGGGAARVDLDGGAPAIGELDEGVDGVDGCAAKPEEATPGREAVSEEPNVVNRITTAF
WELQLPACSDEPISSGTPSSPSSPTKETGDANTVVIDDLFLAHSDAILPAGGDQKEE
HQLGDDLGQQQAATAMEIDDDVIYSLIRNWDNDSSSSNIELLDHAIVSPASCFVPWKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SAACQNAALLAIGTLHQRYPDELQHSPYRYHPRRGGARDYATFWDASSEDDATIMHLA
CMVEAYDAARIDFHHMVRRGLYENNMKILELRQENLQLKKDLDAVEAQLFQLKIAQGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(join(13135. .13944,14966./gene="p0013G02.3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            similar to polyprotein"
      complement(join(47103. .47281,49010. .49076,49786. .49917
                                                                                                                                                                                                                                                                                                                                                                                                                                                        PTGRLLPSWAPGRDPCGREGGGGFEGVACDGATGAVANVSLQGKGLAGTLPPAVAGLT
ALTGLYLHYNRLTGALPRELAALSRLTDLYLNVNNFSGPIPPEIAAMPSLQVVQLCYN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product="putative receptor-like protein kinase"
/protein_id="BAB32930.1"
/db_xref="GI:13161339"
/translation="MAASRLVAAAAIVVVVLVLAGAGAAGAAGAGEVRALLDLAAGLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="P0013G02.6"
complement(join(31561.
34399. .34858))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34399.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SLRLDVVSVQASAPDGLLGLKIRAKYASSAAVVPAMISETLRTAVAGY"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="putative transcription activator"
/protein_id="BAB32928.1"
/db_xref="GI:1316137"
/translation="MVTGGGHRHGGAAAERGEGKEETRRRSTAHPRSTATTKKAAGGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            J∪⊥Π(15203. .16463,18333.
/gene="P0013G02.4"
|cir/1€000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STEDVLLLTFRPGPSQK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VCHPKRRRVCRSLKITARKSTFRPELVRQSLAWTCFVETPCAEPAPVVPQEEEASGVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               pseudogene
                                                                                                                                                                                                                  YRPLISGSGLHKLLVDDLVFSTLKASAAMGYLAPEYTTTGRFSEKSDVYAFGVIVFQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  join(28520. .28527,29674. .29780,30119.
/gene="p0013G02.5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    join(16203. .16463,18333.
/gene="P0013G02.4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="hypothetical protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /pseudo
                                                                                                                                                                                   TGKSKIMQLPLESSNDEDLIDGNLRGCYSAAEAAKLAKIASACTSENPDHRPTMEEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="P0013G02.6"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'note="hypothetical protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             join(28520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           'codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene="P0013G02.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .34858)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .28527,29674.
302.5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .32021,32574.
                                                                                                                          .47281,49010.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .18929,19065. .19457,20680. .20751]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .18929,19065. .19457,20680.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .29780,30119.
                                                                                              .50594,50835.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .33461,33560. .33820,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .15037))
                                                                                                                          .49076,49786.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .30294)
```

```
Query Match
Best Local Similarity
aacaattacagcctgagcgtttcctggcggatatctattacttccggatatgcagttaca 760
                                                       GCATCAGTGATATACTGGAGTACTTTCCACACTGCCATGACAAGGCTCCAGCCGGACAAG 50230
                                                                                    gtattagggacatactggagcactttccgcacagccatgagaagtcctcttctgtccaaa 700
                                                                                                                                                           TTTTAACAGATACAGAGGGAAGTTTCATGGTTGAACGTGTCTACCAAATTGCTGAAGGGT 50290
                                                                                                                                                                                      ttatatagatacagagggcagtttcatggttgaacgtgtctaccagattgctgaagggt 640
                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement()oin(58887. .59081,60870. .61024,61113.
61319. .61416,62180. .62297,62345. .62470,62559. .6
//gene="Pol13002.9"
complement()oin(58887. .59081,60870. .61024,61113.
61319. .61416,62180. .62297,62345. .62470,62559. .6
61319. .61416,62180. .62297,62345. .62470,62559. .6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Join(53315. .53371,53419. .53458,53464. .53574,53856. .53948, 54151. .54511,54550. .54925,55256. .55423,57768. .57953)
//gene="P0013602.8"

Join(53315. .53371,53419. .53458,53464. .53574,53856. .53948,54151. .54511,54550. .54925,55256. .55423,57768. .57953)
//gene="P0013602.8"
//note="hypothetical protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /protein_id="BAB32934.1"
/db_xref="GI:13161343"
/db_xref="GI:13161343"
/translation="MALTSAMTSSPATTSKGGAPRRQHRERERERGGDGELTNGGGDE
/translation="MALTSAMTSGDNGGVAGLRLDAAMPKEETVTTSEDDNGGATAHSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /protein_id="BAB32932.1"
/db_xref="GI:13161341"
/txns1atlon="MopPAAFUGRPIRWRRASTGDGFMLCLKAFALAFGRSSSLVVNP
LTFVARLRPRPHDKPLSLHPSGFAQVLGHGYRVYSALYCAARSDRNLLFRIPLVTLAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EAEEILKVANGANKSKGADGPSTSSVLKGVQNAMDMLSDEQSRRHINTGSADLNNILG
GGIHCKEVTELGGVPGVGKTQLGIQLALNVQITVEXGGJGGKAVIDTEGSFMYERVY
QIAEGGISDILEXFPHCHDKAPAGGDKLKPESFLADIYYFRICSYTEGJAVINYLEKF
LGEHKDVRIVIIDSVTFHFRQDFDDMALRTRVLSGLSLKLMKLSKAYNLAVVLLNQVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           join(63427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AGNIWPEYMVVDETEKVSCFASCENRSELLMEQGQSEEDDMTASLMDQFEIMPQLLHY
FHYENEPDSLDWATIIVYTCKGSCDQNVSYMEBFYWYQLSPATTRTNQSTCPPAGL"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QCNRSSNTIRTQN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MVLFGKLDLAGYEISTESRTICCKFFVLGIELLARNGFVRIADKKTQLAVSIQTTAFR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AEMGLYIDNPYTAKYSDNAGRLRFRCLPISINSKPSMEITGLLESRLILLRNVVCRLS
THDCCEEYCMLQRTCRAGEHPCQLNNIHLFSAGDDRLATLDMTEESCLMCVLDLQLEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VFTAFRFAFYCQRFDEGRTHACRTKEIGVRQREFQPPTGAFGFLAGSCIHAKIGSVLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RLSPRLSWRLANLLYLGQQAKTLGASPTTELATWASHWSKMPTWPGMYLAGVTTEGQA
SWPVDDEVQRPGDGRTVYFAAFFDAGLRLLCDDFLASVLEIYEARLPQLSPSAIAKLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VRDAVNSNSKRVRVM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TKFTEGSFQLTLALGDSWSHSCTNRLILYWNGNERYGFLDKSPSLPVASAPYAVTVKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="putative Rad51C protein"
/protein_id="BAB32931.1"
/db_xref="GI:13161340"
/translation="MEIADLPIATSHRANLLAAGYSSLAALSAASPPRLARDLSIEVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="P0013G02.7"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        50114. .50340,50420. .50490,50561. .50594,50835. .50957,51241. .51345,51594. .51705))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="hypothetical protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="P0013G02.10"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /protein_id="BAB32933.1"
/db_xref="GI:13161342"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="P0013G02.9"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="P0013G02.10"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="hypothetical protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                        11.6%;
76.4%;
                                                                                                                                                                                                                                                                0
                                                                                                                                                                                                                                                                                        Score 171;
Pred. No. 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .63486,63492. .63811,63861.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .63486,63492. .63811,63861.
                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                             DB 13;
                                                                                                                                                                                                                                                                                        .2e-30;
                                                                                                                                                                                                                                                                65;
                                                                                                                                                                                                                                                                                                             Length 163419;
                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .64053)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .64053)
                                                                                                                                                                                                                                                             0,
                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .62774))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .62774))
                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
BC000667
  ORIGIN
                          BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SDOOL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       50109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      50169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          50229
                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    821
```

CDS

CDS

gene

밁 δã 밁 δÃ

50289

641

Matches

CDS

50349

581

δÕ

```
DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TTTTCTTGAACAATTTAGTCTTGAATTATTAGTTT 50075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gtatagttattattgatagtgttactttccacttt 855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CTGAACAAATTGCAGTCATAAACTATCTGGAAAAGTTTCTTGGGGAGCATAAAGATGTAA 50110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Contact: nisc_mgc@nhgri.nih.gov
Shevchenko,Y., Wetherby,K.D., Beckstrom-Sternberg,S.M.,
Benjamin,B., Blakesley,R.W., Bouffard,G.G., Brinkley,C., Brooks,S.,
Benjamin,B., Guan,X., Gupta,J., Ho,S.-L., Karlins,E., Legaspi,R.,
Dietrich,N.L., Guan,X., Gupta,J., Ho,S.-L., Karlins,E., Legaspi,R.,
Lim,M., Maduro,Q.L., Masiello,C., Mastrian,S.D., McCloskey,J.C.,
McDowell,J., Pearson,R., Snyder,B., Stantripop,S., Thomas,P.J.,
Tiongson,E.E., Touchman,J.W., Tsurgeon,C., Vogt,J.L., Walker,M.A.,
Zhang,L.-H. and Green,E.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Series:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Clone distribution: MGC clone distribution
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDNA Library Preparation: Rubin Laboratory
CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)
DNA Sequencing by: National Institutes of Health Intramural
Sequencing Center (NISC),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NIH-MGC Project URL: http://mgc.nci.nih.gov
Contact: Robert Strausberg, Ph.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Direct Submission
Submitted (15-NOV-2000) National Institutes of Health, Mammalian Gene Collection (MGC), Cancer Genomics Office, National Cancer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Tissue Procurement: ATCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MGC:2023, mRNA, complete BC000667
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Homo sapiens,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          through
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Web site:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaithersburg, Maryland;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Institute, 31 Center Drive, Room 11A03, Bethesda, MD 20892-2590,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Strausberg,R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BC000667.1 GI:12653762
   346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (301) 496-1550
L: Robert_Strausberg@nih.gov
a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the I.M.A.G.E. Consortium/LLNL at: IRAL Plate: 5 Row: d Column: 24.
                                                      /translation="mrgktfrremqRDLVSfPLSPAVRVKLVSAGFQTAEELLEVKPS
ELSKEVGISKAEALETLQIIRRECLTNKPRYAGTSESHKKCTALELLEQEHTQGFIIT
                                                                                                             /product="Similar to RAD51 (S. cerevisiae)
/protein_id="AAH00667.1"
/db_xref="GI:12653763"
                              FCSALDDILGGGVPLMKTTEICGAPGVGKTQL*
                                                                                                                                                                                                                                                                                                                                                                                /organism="Homo sapiens"
/db_xref="taxon:9606"
/clone="MGC:2023 IMAGE:3350026"
                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                            /note="Vector: pOTB7"
                                                                                                                                                                                                                                                                                          /tissue_type="Eye, retinoblastoma"
/clone_lib="NIH_MGC_16"
/lab_host="DH10B-R"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 to 1123)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1123 bp
                                                                                                                                                                                                                                       .443
   226 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similar to RAD51 (S. cerevisiae) homolog C, clone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   http://www.nisc.nih.gov/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          information can be found http://image.llnl.gov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  16-MAR-2001
                                                                                                                                                                          homolog
```

Qγ

밁 δÃ

В

```
REFERENCE
AUTHORS
TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT S
ATH296174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches 233;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                                                                gene
                                                                                                                                                                                                                                                                                               source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1132 gtgacaggcaaagggattagagatgctgt 1160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1012
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        832
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           712 cctgagcgtttcctggcggatatctattacttccggatatgcagttacaccgaacaatt 77:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gtgctaagtggattatcattgaagttaatgaagattgcaaagacatataacttggcagtt 951
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATCAAACCTCAGGGATTTAGAGATACTGT 920
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gaacgatacgcacatcttgataagtctccttcacttccagtagcctcagcaccgtatgca 1131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           attgatagtgttactttccactttcgacaagattttgaagatctggcactgaggaccaga 891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCACAAGTTTATCTTCCTTCCAGATTTCCTTTCAGAACACTCAAAGGTTCGACTAGTGATA 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gcagtcataaactacatggagaagttcctcagagagcataaagatgtgcgtatagttatt 833
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CTTGATAATATTCTTTCTCATATTTATTTTTCGCTGTCGTGACTACACAGAGTTACTG 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CAAAGGTTGGCAACATTGTACAAGTCACCCAGCCAGAAGGAATGCACAGTACTGTTTCAA 891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TTAGGGGAAAGTTGGGGACATGCTGCTACAATACGGCTAATCTTTCATTGGGACCGAAAG 831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ctaggtgacagctggtcccactcatgcacgaaccggttgattctgcactggaatgggaac 1071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TTATTAAATGGCCTAGCCCAGCAAATGATCAGCCTTGCAAATAATCACAGATTAGCTGTA 711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtcttgttgaaccaagtcactactaaatttacagaagggtcatttcaattgactcttgct 1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTGGATGGTATTGCCTTTTCCATTTCGTCATGACCTAGATGACCTGTCTTCTTCGTACTCGG 651
                                                                                                                                                                                                                                                                                                                           Direct Submission
Submitted (19-OCT-2000) Siaud N., Reparation/Recombinaison de l'ADN chez Arabidopsis, Institut de Biotechnologie des Plantes, Batiment 630, Universite Paris XI 91405 Orsay Cedex, FRANCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATH296174 2340 bp DNA PLN
Arabidopsis thaliana rad51C gene for Rad51C
AJ296174
AJ296174.1 GI:11064474
RAD51C gene; Rad51C protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II; Brassicales; Brassicaceae; Arabidopsis.

1 (bases 1 to 2340)
                                                                                                                                                                                                                                                                                                                                                                                                                      Siaud, N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               thale cress.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7.0%;
Similarity 51.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
/number=1
join(166. .340,553. .639,742. .864,947. .980,1063. .1133,
1212. .1438,1549. .1680,1766. .1832,1929. .2104)
/gene="rad51C"
                                                                                                                                                     166.
                                                                                                                                                                    /map="locus AAB82635"
/clone_lib="clones Tl
                                                                                                            166. .340
                                                                                                                                                                                                             /db_xref="taxon:3702"
/chromosome="II"
                                                                                                                                                                                                                                                  /organism="Arabidopsis thaliana"
/cultivar="Columbia"
                                                                                                                         /gene="rad51C"
                                                                                                                                                                                                                                                                                                                location/Qualifiers
                                                                                      gene="rad51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 103.4; DB 91; Length 1123; Pred. No. 1.9e-14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches 216; Indels
                                                                                                                                                                      T14P1,
                                                                                                                                                                        F4L23"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0,
                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
  KEYWORDS
                   VERSION
                                         ACCESSION
                                                                                  DEFINITION
                                                                                                       LOCUS
                                                                                                                      AC002387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 174
                                                                                                                                                                                                           1447
                                                                                                                                                                                                                                                                                           1387
                                                                                                                                                                                                                                                                                                                                                                           1327
                                                                                                                                                                                                                                                                                                                                                                                                                                                           1267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             exon
                                                                                                                                                                                                                                                                                                                                                                                                                  705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  645
                                                                                                                                                                                                                                                                                                              acaaattgcagtcataaactacatggagaagttcctcagagaggcataaagatgtgcgtat 824
                                                                                                                                                                                                                                                                                                                                                                                            attacagcctgagcgtttcctggcggatatctattacttccggatatgcagttacaccga 764
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AATAATTTTGAAGTTCCCATCCCGTTGATTTGCTGCTACAAGTGTATATTGTGACA
                                                                                                                                                                                                                                             agttattattgatagtgttactttccactttcgacaagattttgaagatctggca 879
                                                                                                                                                                                                                                                                                                                                                                         AATGAAACCAGAAGATATCTTAGAGAACATATTCTACTTCCGTGTCTGCAGTTACACCGA 1386
                                                                                                                                                                                                                                                                                                                                                                                                                                                      AGAGGACATGGAAGAATACACAGGATACATGCATAAACATTTTCAAGCAAATCAAGTACA 1326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tagggacatactggagcactttccgcacagccatgagaagtcctcttctgtccaaaaaca 704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TACAGATACAGAAGGTAGCTTCATGGTGGAGCGTGCTTTACAGATAGCAGAAGCTTGTGT 1266
                                                                                                                                                                                                                                                                                         GCAAATCGCATTGGTCAATCATCTTGAAAAGTTCATCTCTGAAAACAAAGATGTAGGTAT
                 complete sequence. Sequence AC002387 AE002093 AC002387.2 GI:6598365
                                                          Arabidopsis thaliana chromosome II section 242 of 255 of the complete sequence. Sequence from clones T14P1, F4L23.
                                                                                                     AC002387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity 59.0
74; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /number=8
1929. .2104
/gene="rad51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /evidence-experimental
/product="Rad51C protein"
/protein_id="CAC14294.1"
/protein_id="CAC14294.1"
/db_xref="GI:11064475"
/translation="MISFGRRKSPAIEETSLATSVMEAWRLPLSPSIRGKLISAGYTC
LSSIASVSSDLARDANITEEEAFEILKLANQSCCNGGRSLINGAKNAWDMLHEEESL
PRITTSCSDLDWILGGGISCRDVTEIGGVPGIGKTQIGIOLSVNVQIPRECGGLGKA
IYIDTEGSFMVERALQIAEACVEDMEEYTGYMHKHFQANQVQMKPEDILENIFYFRVC
SYTEQIALVNHLEKFISSNKDVKVVIVDSITFHFRQAVQDDLAQFRVLSEMALKFMKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /number=9
436 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /number=3
947. .980
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SLPSASASYTVTSRGLRNSSSSSKRVKMM*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1766. .1832
/gene="rad51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1063.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AKKFSLAVVLLNQVTTKFSEGSFQLALALGDSWSHSCTNRVILYWNGDERYAYIDKSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /number=7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="rad51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="rad51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="rad51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="rad51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="rad51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /number=6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /number=5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="rad51C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    'number=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             number=2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                   122871 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          59.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .1133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .1680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .1438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 101.4; DB 13; Length 2340; Pred. No. 6.2e-14; 0; Mismatches 121; Indels 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    758 t
```

Gaps

0,

1446

밁 Ş ВÞ Ş 망 Qγ 밁 δÃ 밁 VΩ В ρy

SOURCE KEYWORDS

FOCUS

FEATURES

CDS

exon

```
REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOURCE
                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PUBMED
                                                            misc_feature
repeat_region
                                                                                                                                                                                                             source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  prediction programs including GRAIL

(ftp://arthur.epm.ornl.gov/pub/xgrail), Genefinder (Phil Green,
University of Washington), Genscan (Chris Burge,
http://gnomic.stanford.edu/GENSCANW.html), and NetPlantGene
(http://www.cbs.dtu.dk/services/NetGene2/), searches of the
complete sequence against a peptide database and plant EST
databases at TIGR, and manual curations based on those analyses.
Annotated genes are named to indicate the level of evidence for
their annotation. Genes with similarity to other proteins are named
after the database hits. Genes without significant peptide
similarity but with EST similarity are named as 'unknown' proteins.
Genes without protein or EST similarity, that are predicted by two
or more gene prediction programs over most of their length are
annotated as 'hypothetical' proteins. Genes encoding tRNAs are
                                                                                                                                                                                                                                                                                                                                                                                                                                       We thank the CSHL/WashU/ABI consolition.

F6P3, F5J6, T17A5, and T13L16, the ESSA group for sequences, F13D4, and Scott Jackson, Jiming Jiang, Klaus Meyer, Eric Richards and Satoshi Tabata for helpful assistance. In addition, we would like to thank the TIGR Bioinformatics Department, especially Lixin like to thank the TIGR Bioinformatics Department, especially Lixin like to thank the TIGR Bioinformatics Department of Section 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Submitted (09-MAR-2000) The Institute for Genomic Research, 9712 Medical Center Dr., Rockville, MD 20850, USA On Dec 17, 1999 this sequence version replaced gi:2583106. The sequence and annotation of chromosome 2 were merged from those of the individual clones on this chromosome after removing overlaps. For detailed information, please see the TIGR web site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Lin,X., Kaul,S., Rounsley,S.D., Shea,T.P., Benito,M.-I., Town,C.D., Fuji,C.Y., Mason,T.M., Bowman,C.L., Barnstead,M.E., Fuji,C.Y., Mason,T.M., Bowman,C.L., Barnstead,M.E., Feldblyum,T.V., Bueil,C.R., Ketchum,K.A., Lee,J.J., Ronning,C.M., Koo,H., Moffat,K.S., Cronin,L.A., Shen,M., Vankken,S.E., Umayam,L., Tallon,L.J., Gill,J.E., Adams,M.D., Carrera,A.J., Creasy,T.H., Goodman,H.M., Somerville,C.R., Copenhaver,G.P., Preuss,D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                             Address all correspondence to:
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           http://ftp.genome.washington.edu/RM/RepeatMasker.html). Genes are numbered from the top to bottom of the chromosome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           http://genome.wustl.edu/eddy/tRNAscan-SE/). Simple repeats were identified by repeatmasker (Arian Smit,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Genes were identified by a combination of three methods: Gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Lin, X
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nature 402 (6763), 761-768 (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence and analysis of chromosome 2 of the plant Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Venter, J.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Nierman, W.C., White, O., Eisen, J.A., Salzberg, S.L., Fraser, C.M. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      thale cress.
                                                                                                                                                                                                                                                                                                                                This work was supported by the National Science Foundation, Department of Energy and the US Department of Agriculture.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  predicted by tRNAscan-SE (Sean Eddy,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (http://www.tigr.org/tdb/at/at.html)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (bases 1 to 122871)
                                                                                                                                                                                                                                                                                                                                                                                                                              support.
/note="Sequence from clone T14P1"
complement(519. .627)
                                                   complement(<1. .2952)
                                                                                      /chromosome="II"
                                                                                                                                                      /organism="Arabidopsis thaliana"
/cultivar="Columbia"
                                                                                                                         /db_xref="taxon:3702"
                                                                                                                                                                                                                       .12287
                                                                                                                                                                                                                                                                             at@tigr.org
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for sequencing clone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mRNA
                                                                                                                                                                                                                                                                                                                                                                                                    gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      mRNA
                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           repeat_region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        repeat_region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   repeat_region
                                                                                                                                                                                                                                                                                                                                                                                                                              complement(join(15613. .15729,15821. 16252. .16341,16810. .17006,17451. .1/gene="At2945200"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(join(6393. .6470,6586. .6663,7082. .71 7248. .7296,7872. .8004,8099. .8260,8382. .8495))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /rpt_family="POLY_A"
complement(join(<6393. .6470,67248. .7296,7872. .8004,8099.
/gene="At2945190"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="maskalavtallitunlleftevtstkcppttpkppktpkspkk
apavkptcptdtlklgvcadllglvnvvvgsppktpcctllqglanleaavclctalk
anvlginlnvpidltlllnycgkkvphgeqcs"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Juin(2227. .2322,2480. .2527,2650. .2705,3098. .3150,
3250. .3641)
/gene="At2945170"
                                   /translation="MTESSLDLQESGWEELRREARKIEGDLDVKLSSYAKLGARFTQG
GYVDTGSPTVGSGRSWKSMEMEIQSLLEKLLDINDSMSRCAASAAPTTSVTQKLARHR
DILHEYTQEFRRIKGNINSLREHAELLSSVRDDISEYKASGSMSPGVQVLRERASIHG
                                                                                                                                                                                                                                       complement(join(15632. .15729,15821. 16252. .16341,16810. .17006,17451. .1 /gene="Attg45200"
                                                                                                                                                                                                                                                                                                                                                                 complement(15613..17647)
/gene="At2g45200"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /rpt_family="(GA)n"
12613. .12646
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /translation="msmssmsspssavcspdhfspsdhlcyvqcnfcqtilavnvpyt
slfktvtvrcgcctnllsvnmrsyvlpasnqlqlqlgphsyfnpqdileelrdapsnm
nmmmnqhptmndipsfmdlhqqheipkappvnrppekrqrvpsaynrfikeeiqrik
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(<6393. .>8495)
/gene="At2g45190"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(2953.
   SISHIDDVIGQAQATRAVLGSQRSLFSDVQGKVKNLGDKFPVIRGLLGSIKRKRSRDT
                                                                                                                      /product="putative cis-Golgi SNARE protein"
/protein_id="AAB82642.1"
/db_xref="GI:2583133"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PAAANVGVTPY"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AGNPD I SHREAF SAAAKNWAHF PH I HFGL V PDNQ PVKKT NMPQQEGEDNMVMKEGF Y A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="putative proline-rich protein"
/protein_id="AAB82643.1"
/db_xref="GI:2583134"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4282. .4870
/gene="At2g45180"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EDGFLYITYSGENTFGASSI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NIDKKKYLVPSDLTVGQFVYVIRKRIKLSAEKAIFIFVDNVLPPTGELMSSVYEDKKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="putative microtubule-associated protein"
/protein_id="AAF18602.1"
/db_xref="G1:6598366"
/translation="MNKGSIFKMDDDFEKRKAEAGRIREKYPDRIPVIVEKAEKSEVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  join(2488. .2527,2650. .2705,3098. .3150,3250. .3469)
/gene="At2g45170"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /rpt_family="(CATA)n"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /protein_id="AAB82644.1"
/db_xref="GI:2583135"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="unknown protein"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="F4L23.30"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="F4L23.31"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="Sequence from clone F4L23"
                                                                                                                                                                                                                                                                                                                                             /note="F4L23.29"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="At2g45180"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    'gene="At2g45180"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               note="T14P1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="At2g45170"
                                                                                                                                                                                                                       /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .10201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .>122871)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .6470,6586. .6663,7082. .7157,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .8260,8382. .>8495))
                                                                                                                                                                                                                                                                                1. .15950,16066. .16137,
.17583))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .15950,16066. .16137,
```

```
Best
                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
    49327
                                                                                                                                                                          49207
                                                                                                                                                                                                                                                        49147 AGAGGACATGGAAGAATACACAGGATACATGCATAAACATTTTCAAGCAAATCAAGTACA 49206
                                                                                                                                                                                                                                                                                                                                            49087 TACAGATACAGAAGGTAGCTTCATGGTGGAGCGTGCTTTACAGATAGCAGAAGCTTGTGT 49146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       repeat_region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           repeat_region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                repeat_region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          misc_feature
                                                                                                                                                                                                                    705
                                                                                                                                                                                                                                                                                                                                                                585 tatagatacagagggcagtttcatggttgaacgtgtctaccagattgctgaagggtgtat 644
                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Sin hes 174;
                                                                                                            AATAATTTTGAAGTTCCATCCCGTTGATTTGCTGCTACAAGTGTATATTGTGACA 49381
                                       agttattattgatagtgttactttccactttcgacaagattttgaagatctggca 879
                                                                                                                                                                      AATGAAACCAGAAGATATCTTAGAGAACATATTCTACTTCCGTGTCTGCAGTTACACCGA 49266
                                                                                                                                                                                                   attacagcctgagcgtttcctggcggatatctattacttccggatatgcagttacaccga 764
                                                                                                                                                                                                                                                                                                tagggacatactggagcactttccgcacagccatgagaagtcctcttctgtccaaaaaca 704
                                                                                    GCAAATCGCATTGGTCAATCATCTTGAAAAGTTCATCTCTGAAAACAAAGATGTAGGTAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /rpt_family="POLY complement(29132.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /rpt_family="(TA)n"
28701. .28741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FNSATVAAVGDGFIARGITFRNTAGASNEQAVALRSGSDLSVFYQCSFEAYQDTLYVH
SNRQFYRDCDVYGTVDFIFGNAAAVLQNCNIFARRPRSKTNTITAQGRSDPNQNTGII
IHNSRVTAASDLRPVLGSTKTYLGRPWRQYSRTVFMKTSLDSLIDPRGWLEWDGNFAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(join(22224. .22909,23488. .24334))
/gene="At2g45220"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(<22224. .>24334)
/gene="At2g45220"
/note="F4L23.27"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(join(<22224. .22909,23488. .>24334))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VYFNHPLFGELLREAEKEYGFCHEGGITIPCLYSDFERVKTRIASGSSSRVFPWGRHC
RN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="putative auxin-induced protein"
/protein_id="AAB82641.1"
/protein_id="AAB82641.1"
/db_xref="GI:258132"
/translation="MAKIIGFRIGRRVSRWIFRKTRIORSGYNRIHSTOOACMLMRPL
/translation="MAKIIGFRIGRRVSRWIFRKTRIORSGYNRIHSTOOACMLMRPL
AKLKSWGQRLKQSFRRRSTRRSAYIPVDHKKADPVPRGHLAIYVGQKDGDCHRVLVPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="At2445210"
19741. .>20315
/gene="At245210"
/note="F4123.28; member of auxin-induced protein multigene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(18449.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23009. .23038
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KTLFYAEFQNTGPGASTSGRVTWPGFRVLGSASEASKFTVGTFLAGGSWIPSSVPFTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(17986.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /rpt_family="POLY_A"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="At2g45220"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LILSAVIAACTLFLIIYWLSK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="At2g45210"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            19827
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="molecular marker ML"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            rpt_family="(TAAAA)n"
                                                                                                                                                                                                                                                                                                                                                                                                                                                  59.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      family="POLY_A"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .>20315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .20315
                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                              Score 101.4; DB 1
Pred. No. 7.5e-14;
0; Mismatches 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              18564)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         . 29228)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .18862)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 12; Length 122871;
                                                                                                                                                                                                                                                                                                                                                                                                                                 121;
                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                    49326
                                                                                                                                                                                                                                                                                                                                                                                                                              0;
```

B 8

Klenk,H.P., Clayton,R.A., Tomb,J., White,O., Nelson,K.E.,
Ketchum,K.A., Dodson,R.J., Gwinn,M., Hickey,E.K., Peterson,J.D.,
Richardson,D.L., Kerlavage,A.R., Graham,D.E., Kyrpides,N.C.,

```
REFERENCE
AUTHORS
                                                                                          ACCESSION
VERSION
                                                                                                                                             RESULT 12
AE001035/c
                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                    밁
                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                             Ω
                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                SOURCE
                                                                              KEYWORDS
                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Continuation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WPCOMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 11
                                                                                                                                    CUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LMFLCHR32_17
                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity bi...
740; Conservative
                                                     ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence split into 28 fragments
                                                                                                                                                                                                   33116
                                                                                                                                                                                                                                                                                                         32996 TGGCGGCGTCACCGAGATCAGTGGGCCCCCTGGCGTTGGCAAGACACAGCTGTTGATGCA 33055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LMFLCHR32_04

LMFLCHR32_05

LMFLCHR32_06

LMFLCHR32_07

LMFLCHR32_08

LMFLCHR32_09

LMFLCHR32_10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LMFLCHR32_13
LMFLCHR32_14
LMFLCHR32_15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LMFLCHR32_16
LMFLCHR32_17
LMFLCHR32_18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LMFLCHR32_24
LMFLCHR32_25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LMFLCHR32_26
LMFLCHR32_27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LMFLCHR32_21
LMFLCHR32_22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LMFLCHR32_11
LMFLCHR32_12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Fragment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LMFLCHR32_23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LMFLCHR32_20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LMFLCHR32_00
                                                                                                                                                                                                               585 tatagatacagagggcagtttcatggttgaacgtgtctaccagattgc
                                                                                                                                                                                                                                                                                525
                                                                                                                                                                                                                                                                                                                                   465
                                                                                                                                                                                                                                                                                                                                                                                      405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LMFLCHR32_19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LMFLCHR32_03
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LMFLCHR32_02
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LMFLCHR32_01
                                                                                                                                                                                                                                                                     actagcaatcaatgtacaaatcccagtggaatgtggtggccttggtggaaagcagttta 584
                                                                                                                                                                                                                                                                                                                                                                           gaaacacatcactactggttctggtgacctcaatgacatacttggtggcgggattcactg 464
                                                                                                                                                                                                  CGTTGATACGGAGGGCAGCTTTGTGGCTGAGCGCTTAGAGCAAATGGC 33163
                                                                                                                                                                                                                                                      GCTAGCAGTTAGCTGTGCCATGCCAGTAGAGTTCGGAGGGATGGGTGGCGCGTGCCTTTT 33115
                                                                                                                                                                                                                                                                                                                       caaagaagttactgagatcggtggcgtcccaggggttggtaaaactcaactggggattca 524
                                                                                                                                                                                                                                                                                                                                                            GACCCACGTGACAACCTTCTCTGGGGAGCTCGACGGCGTACTTGGAGGTGGCGTTCCCCGT 32995
1 (bases 1 to 10980)
Klenk, H.P., Clayton, R.A.,
                                                                                                       Archaeoglobus fulgidus section AE001035 AE000782
                           Archaeoglobus.
                                       Archaea; Euryarchaeota;
                                                    Archaeoglobus fulgidus. Archaeoglobus fulgidus
                                                                                          AE001035 AE000782
AE001035.1 GI:2689358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 28)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1000001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  240000
                                                                                                                                 10980 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        200000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1400001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120000:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1100001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .90000:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 800001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       50000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               100001
200001
300001
                                                                                                                                                                                                                                                                                                                                                                                                                           5.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LMFLCHR32
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     710000
810000
910000
1010000
1110000
1210000
1310000
1410000
1510000
1510000
1510000
1610000
1810000
2110000
22110000
2310000
2510000
2510000
                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                          Score 87.2; DB Pred. No. 2e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 510000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       110000
                                      Archaeoglobales; Archaeoglobaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Locus
                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              base 1700001 (AL499622 Leishmania major
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LMFLCHR32
                                                                                                                  72 of 172 of the complete genome.
                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 84;
                                                                                                                                                                                                                                                                                                                                                                                                                88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Accession AL499622
                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 110000;
                                                                                                                                  15-DEC-1997
                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                               0
```

chr

CDS

gene

```
REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Klenk, H.P., Clayton, K.A., Tomb, J., White, O., Nelson, K.E., Ketchum, K.A., Dodson, R.J., Gwinn, M., Hickey, E.K., Peterson, J.D., Richardson, D.L., Kerlavage, A.R., Graham, D.E., Kyrpides, N.C., Fleischmann, R.D., Quackenbush, J., Lee, N.H., Sutton, G.G., Gill, S., Kirkness, E.F., Dougherty, B.A., McKenney, K., Adams, M.D., Loftus, B., Peterson, S., Reich, C.I., McNeil, L.K., Badger, J.H., Glodek, A., Zhou, L., Overbeek, R., Gocayne, J.D., Weidman, J.F., McDonald, L., Utterback, T., Cotton, M.D., Spriggs, T., Artlach, P., Kaine, B.P., Sykes, S.M., Sadow, P.W., D'Andrea, K.P., Bowman, C., Fujii, C., Garland, S.A., Mason, T.M., Olsen, G.J., Fraser, C.M., Smith, H.O., Weese, C.R. and Venter, J.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Fleischmann, R.D., Quackenbush, J., Lee, N.H., Sutton, G.G., Gill, S., Kirkness, E.F., Dougherty, B.A., McKenney, K., Adams, M.D., Loftus, B., Peterson, S., Reich, C.I., McNeil, L.K., Badger, J.H., Glodek, A., Zhou, L., Overbeek, R., Gocayne, J.D., Weidman, J.F., McDonald, L., Utterback, T., Cotton, M.D., Spriggs, T., Artlach, P., Kaine, B.P., Sykes, S.M., Sadow, P.W., D'Andrea, K.P., Bowman, C., Fujli, C., Garland, S.A., Mason, T.M., Olsen, G.J., Fraser, C.M., Smith, H.O.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The complete genome sequence of the hyperthermophilic, sulphate-reducing archaeon Archaeoglobus fulgidus Nature 390 (6658), 364-370 (1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           medical Center Dr. Rockville, MD 20850, USA
In order to show the genes in ascending order on the genome, the
origin of this version has been moved by TIGR to position 2093570
of the original version and the opposite strand is shown from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Submitted (15-DEC-1997) The Institute for Genomic Research, 9712 Medical Center Dr. Rockville, MD 20850, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  98049343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Woese, C.R. and Venter, J.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (bases 1 to 10980)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="Ar(971...1984)
complement(971...1984)
/gene="AF0993"
/note="similar to GB:L77117 SP:Q49593 PID:1378034
/note="similar to GB:L77117:_59.29; identified b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="hypothetical protein; identified by GeneMark; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PID:1591553 percent identity: ! sequence similarity; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INAKEEIEAAETVEELKEAMKNAREVWRDAKVSLQKSIIIGVLDRLETFVEKGENLEN
FVEGKIAEFEEEGKDTTLLENWLDSYREHREWALEKIGEAKEKVLEIETPQQGFEAMK
EVREAVKTAVQHTKECVKDLAEIIQLINQYGDAEDSEELMQVVEEVVEE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="A. fulgidus predicted coding region AF0992"
/protein_ld="AAB90251.1"
/db_xref="G1:5649605"
/translation="MLGKFGRMLGYLALLYLYAPAMAAGNGEDLRNTYKYFEKYRDWQ/
/translation="MLGKFGRMLGYLALLYLYAPAMAAGNGEDLRNTYKYFEKYRDWQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /db_xref="taxon:2234"
159. .962
                                                                                                                                          QMAEAKGLDGNEVLKNIYVAQAYNSNHQMLLVDNAKELAEKLKKEGRPVRLIIVDSLM
SHFRÄEYVGRGTLADRQQKLNRHLHDLMKFGELYNAAIVVTNQVMARPDVLFGDPTKP
                                                                                                                                                                                                                                                                                                                  /product="DNA.repair protein RAD51 (radA)"
/protein_id="AAB90248.1"
/db_xref="GI:2649602"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="AF0993"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(971. .1984)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REGIVLNNDTLDEARNLGVAMVDEGVASLESIKNRLEESNLSMKDEIIAEINEHITDL
                                                                                                                                                                                                                 SELANYGGITEGNAVKIIQAARKLANIGGFESGDKVLERRRSVKKITTGSKDLDELLG
GGVETQAITEFFGEFGSGKTQICHQLAVNVQLPEDEGGLEGSVIIIDTENTFRPERII
                                                                                                                                                                                                                                                                                                                                                                                                                                  /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location,
/gene="AF0994"
                                                                                                            VGGHIVAHTATFRIYLKKGKDDLRIARLIDSPHLPEGEAIFRVTERGIEDAEEKDKKK
                                                                                                                                                                                                                                                                                           translation="MSEESNEETKIIELEDIPGVGPETARKLREAGYSTIEAVAVASP/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="AF0992"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      organism="Archaeoglobus fulgidus"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1997 this sequence version replaced gi:2649594.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AF0992"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              bу
```

```
/transl_table=11
/product="conserved hypothetical protein"
/protein_id="AaB90246.1"
/protein_id="AaB90246.1"
/protein_id="AaB90246.1"
/db_xref="G1:2649600"
/db_xref="G1:2649600"
/translation="MFKERNRLTYIGYRLFAEDIMKKESKYFELERSLKKAMISMPPE
/translation="MFKERNRLTYIGYRLFAEDIMKNESKYFELERSLKKAMISMPPE
MYIATARWESLLFGIIGAVIGLIAAFILVKYUGVPPPENIRLPHAIIFMYSLSKGGMSLVQ
AGILAIGITLALYYLGNLIFAIYPSTVISDRKKKINFALAEAVDVTPPSDNFKEFLHGLIT
IIDSGGDITRYFEERAEFYFERARODOKSFLEFIGLMAETYITAFVAGPLFLIIIOTV
MSVWGQTNEVAMFSIIYFVIPIGSFMFAMLIKLITPGEEGSAFRLRERYIYVRRSSEL
DSEEKKKLEKKYSRYKLMKKLKNPFRLIVENPLYTFAFSIFAALVILLYGLVVNPYIP
GMDLKNWFFSYDDYIFISLMVVLGPFALFELGRRGVKTYMRLTPIFISKLASANESG
MPITRAITMIAKTDTSPLRKEIAKIKADLDWGISLSDALVRFANRLKIFEISTMTILL
NEALKSTGNVTEYLMISAKDATSAELLRERRINMFMYVIYIAFFFFFIGIVYIISS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="similar to GB:L77117 SP:Q58310 PID:1591575 percent identity: 41.71; identified by sequence similarity; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="MSSHDEGHVERVIKLARYIAEREGARLDVVLKAAELHDIARGYP NHARKSAEIABELLKOHDAEFYEAVCHAIEAHSFSGKMKPKTLEAKILSDADKLDAIG AIGVARAFLYSGEKGKSIEETLKHFEEKLLKLRDLLYTETARKIAEERHRFLEIFYRQ IKKELDEFEAEGDAEDYVGNGCHYK"

COMPLement (2532. .4487)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="MPKINFRQLKFRGKEQEESEEEAEQLADYEKBALEAIEEVKQK
EEILKYKREKKIIGLPKRKEYSVEEHGELVEYSPPVGWSIVEEYMLLEPYCKAFIIY
NEEEGEYKYQVEEPKLPYETEYYGHLSVLLKOKLEBNFFEDGKVAKEYVLKETFPDL
ISEVGFDLEDRSYYKIWYYIMRDFLYYDKITPLMLDKMLEDISCNGVRKYMYVFHRNY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(4489. .6198)
/gene="AF0996"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(4489. .6198)
/gene="AF0996"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="similar to GB:L77117 PID:1591923 percent identity: 26.90; identified by sequence similarity; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="similar to SP:P54168 PID:1256633 GB:AL009126 percent identity: 43.75; identified by sequence similarity; putative"
/product="N-ethylammeline chlorohydrolase (trza-2)" /protein_id="AAB90244.1" /db_xref="GI:2649598" /db_xref="GI:2649598" /translation="MHDLVIRNGLCFINGEFVECSVGVDGNRITHVAKEVERGEIEID /translation="MHDLVIRNGLCFINGEFVECSVGVDGNRITHVAKEVERGEIEID AGGCLVMPGCFNAHTHAAMTLLRGYAEGLPLREWLEKVWEVEARLDEDAVYWGTMLAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AISLFIPRRSKIVTIEDTRELMLPHENWIPAVTRDAFHGEKGAVDMYDLLRAALRORP
EYIIYGEVRGKEALTLEQAMATGHTTYSTLHADSISGAHHRLENPPIGVERPMLEALD
IISLQAQTYYGDRRVERMEIAEIVGLDAHTKHLRTSTVFGWDSVKDEHAMVGTSKAL
EEIRRQRGWSVRELNEELERRRRVLEFMLEHNVRDFKRVSNIIHTYQTKPDKIMEAIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="type II secretion system protein (gspE-3)"
/protein_id="AAB90245.1"
/db_xref="GI:2649599"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TFLSTLAESAAKVQATGQNFQMLQSVDVTLYRNVFMHAAVFQGIFAGMVAGVMGEGSL
SAGAKHSLIMLTIAYIVFSVLFGFKLI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(2532. .4487)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="conserved hypothetical protein"
/protein_id="AAB90247.1"
/db_xref="GI:2649601"
                                                                                                                                                                                                                                                                                 /note="similar to GB:L777117 PID:1592173 percent identity: 44.50; identified by sequence similarity; putative"
                                                                                                                                                                                                                                                                                                                                                                                                 complement(6259. .7509)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(6259. .7509)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TNLRTNVIFDDPDELDSFVVNLAQKCGKHISIAEPMVDATMPDGSRIQMTLGREVTDH
GSTFTIRKFREEPVTPIDLIAWKTFSSEQMAYLWLCIENKKSLIFAGGTASGKTTSMN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="AF0995"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="AF0994"
                                                                                                                                                                                                                                                                                                                                                             /gene="AF0997"
                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="AF0997"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="AF0995"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                                        /transl_table=11
                                                                                                                                                                                                                                        /codon_start=1
```

CDS

CDS

gene

```
DEFINITION
                                                                                                             AE000901/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                          1490 G 1490
                                                                                                                                                                                                                                                                                                                                    1550 GATTATCATCGACACAGAGAACACATTCAGGCCTGAGAGGATAATCCAGATGGCTGAGGC 1491
                                                                                                                                                                                                                                                                                                                                                                                                                                           1730 GTCTGTTAAGAAAATAACTACTGGGAGCAAAGACCTCGACGAGTTGCTTGGTGGTGGAGT 1671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  459 tcactgcaaagaagttactgagatcggtggcgtcccaggggttggtaaaactcaactggg 518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             399 gtcacagaaacacatcactactggttctggtgacctcaatgacatacttggtggcgggat 458
                                                                                                                                                                                                                                                                                                                                                                                  579 agtttatatagatacagagggcagtttcatggttgaacgtgtctaccagattgctgaagg 638
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gattcaactagcaatcaatgtacaaatcccagtggaatgtggtggccttggtgggaaagc 578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TGAGACCCAAGCCATAACCGAGTTTTTTGGAGAGTTTTGGTAGTGGTAAGACTCAAATCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          139;
Methanobacterium thermoautotrophicum from bases 1243964 to 1257931 (section 107 of 148) of the complete genome. AE000901 AE000666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
/product="conserved hypothetical protein"
/protein_id="anapo243.1"
/protein_id="anapo243.1"
/db_xref="GI:2649597"
/translation="MMVLLSRKDTIRFLILSELMVNPECNQRDIAKKLGLTPQAISEH/KLTANSPATTONE"MAYLLSRKOTIRFLILSELMVNPECNQRDIAKKLGLTPQAISEH/KLTANSEGFINVVHKGYYEVTRKGEENMSRNLIDLHLFSEELLKKIYSKTVVAIAKGRIAENDSYRYMFODGYITAERSAKGNGVALTSAEDGEDVILKPTGSFEPPEKGEIIIVKVPGVALGGERKTVDLDSFRELVKSRPTSIVVAIGIEALVTCRKIRVEPIFFGAKEVCIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EKWNGGFEGRVTTMLAPHAPYTCSPEFLKVVSDASKDKGFLKHIHVSETLWEVKEVRE
RYGKRPVEFLDSIGFLDSSTVLAHAVWLSEAEMKILAERGVSVAHCPTSNLKLSSGIA
KVSELLEMGVNVGIGTDGAASNNMLSVLSDARVGALLQNLRGRTLKPGHWLEMATEGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="AF0998"
7581. .8357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(9003. .9746)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /translation="mKGALLLVLLILTISTTSAVEIYGKVYRWDTLDVLSGAVVEVRD
GSVQRMVAENGEYSFNVTPGNYTIIARSGEYYAIENVTVSSDMRFDLILFPSLEEVEE
IPDFPVVDQQEEFPYYIVAILVSGFVLAALFIVKIRSEKQPELLEQEVTPEEYDLPED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="hypothetical protein; identified by putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(8350. .9006)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="AF0999"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(8350. .9006)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAHHGSGVIVACTESMLNDLLRSLIDEGLEFEIKEFVKAT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         identity: 27.52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="AF0998"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ILVNVEEEKVIEKAEETALELVGG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YRAYNLKGGRIEEGYLADIVVFSKTCRNAPMHDPAAMLYVENQALHAVVDGVLVMEDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="AF1000"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LAEVVELIKREGGRITQKELRKKLGYSEAKMSLIIADLERRGIVEKVKKGRGNIIFLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /transl_table=11
/product=Na. fulgidus predicted coding region AF0999"
/protein_id="AAB80250.1"
/db_xref="GI:2649604"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="similar to GB:L77117
identity: 27.52; identified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VEMLKSGVTAFADMYIHMDAVAEAVGESGMRAVLGYGMADRGDEERARKELEIGLEFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        'codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5.3%;
57.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AF0999"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 77.8; DB 1; Pred. No. 3.4e-08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SP:Q57978 PID:1591264 percent
by sequence similarity;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 10980;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                   15-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GeneMark;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0
```

Qy DЬ δÃ 밁 Ş

В Qy 밁

밁 δÃ

```
REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JOURNAL
                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 smith,D.R., Doucette-Stamm,L.A., Deloughery,C., Lee,H., Dubois,J
Aldredge,T., Bashirzadeh,R., Blakely,D., Cook,R., Gilbert,K.,
Harrison,D., Hoang,L., Keagle,P., Lumm,W., Pothier,B., Qiu.D.,
Spadafora,R., Vicaire,R., Wang,Y., Wierzbowski,J., Gibson,R.,
Jiwani,N., Caruso,A., Bush,D., Reeve,J.N. et,al.
Complete genome sequence of Methanobacterium thermoautotrophicum
deltaH: functional analysis and comparative genomics
J. Batteriol. 179 (22), 7135-7155 (1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Methanothermobacter thermautotrophicus Methanothermobacter thermautotrophicus Archaea; Euryarchaeota; Methanobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Submitted (10-AUG-1997) Genomics and Technology Development, Genome Therapuetics Corporation, 100 Beaver Street, Waltham, MA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Smith, D.R.
Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Therapuetics Corporation, 100 02154-8448, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98037514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AE000901.1 GI:2622486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Methanothermobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (bases 1 to 13968)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (bases 1 to 13968)
/product="conserved protein (contains ferredoxin domain)"
/protein_id="AAB85856.1"
/db_xref="GI:2622489"
/translation="MRIAWAFTGAGHLLLESVEALEAMVEGGHEVTILLSGAAEEVLR
MYGLLERVKRLSGGYYRELITEDQEGYSFPITGRLSMGRYDLLVVSPVTSNTVAKVVH
GIADTLYTNAVAQAGKGGVPVYCVPVDLEEGDVETVLPSKLELELCRGCEPCLAAAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="Function Code:9.10 - Metabolism of Cofactors and Vitamins, Porphyrin and chlorophyll metabolism; similar to, sp:LN:CPCE_FREDI AC:P07126:P05520, p()=1.7E-09, pid=55%"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(502. .900)
/gene="MTH1378"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GKIRDSGTRVGDTIEFRDLQS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              similar to, pir:LN:G64486 AC:G64486, p()=7E-10, pid=298"
                                                                                                                                                                                                                                                                                       complement(1027. .1737)
/gene="MTH1379"
                                                                                                                                                                                                                                                                                                                                           complement(1027. .1737)
/gene="MTH1379"
                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
/transl_table=11
/product="phycocyanin alpha phycocyanobilin lyase CpcE"
/protein_id="AAB85855.1"
/db_xref="GI:2622488"
/translation="MFFMEGKRIDFLLEELRNPDWVVREDAVELLAEVADPRAVGPLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(502. .900)
/gene="MTH1378"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="conserved protein"
/protein_id="AAB85854.1"
/db_xref="GI:2622487"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /strain="delta H"
/db_xref="taxon:145262"
                                                                                                                                                                                                                pid=48%"
                                                                                                                                                                                                                                         similar to,
                                                                                                                                                                                                                                                                                                                                                                                             EALDDEDYHVREAAALALATFDDRMAVEFLREHLSDDKFGVRYACALALGILGDEDSI
PDLEELLDDESFMVRRVAEVAISEIRKRAA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IPVGRGRYGSGIHMFFMLVPLDVLFVDGDMRVVDSVTLRPWQIYNPRKPARYVIELRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="MTH1377"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /organism="Methanothermobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          translation="MMKREVINKTRGTSLGAVRFARTFMSRFRGLMLRRDVETGLVLE/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="Function Code:14.01 - Unknown, Conserved protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="MTH1377"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /clone="MTH"
                                                                                                                                                            transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ocation/Qualifiers
                                                                                                                                                                                     'codon_start=1
                                                                                                                                                                                                                                                                    note="Function Code:14.01 -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . .13968
                                                                                                                                                                                                                                      tion Code:14.01 - Unknown, Conserved sp:LN:Y208_METJA AC:Q57661, p()=1.2E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Methanobacteriaceae;
                                                                                                                                                                                                                                           p()=1.2E-51,
                                                                                                                                                                                                                                                                 protein;
```

```
CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                          gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                           complement(6276. .7211)
/gene="MTH1383"
/gene="MTH1383"
/note="Function Code:10.09 - Metabolism of Macromolecules,
DNA replication--modification--repair--and recombination;
Similar to, sp:LN:RADA_SULSO AC:Q55075, p()=6.6E-85,
id=14.4
                                                                                                                                                                                                                                                                                                                                      /db_xref="GI:2622492"
/translation="MIEMGSTEVLSVLVLVLLGYILKVLGVLGEEDASTLNRVVINV
/translation="MIEMGSTEVLSVLVLVLUSGYILKVLGVLGEEDASTLNRVVINV
AIPSLIFTSLYRADLSGISDLVLIPVICMITGTLSGTIAYLWARRRGLDSGKTWGLTV
AAAMMNSGFLGYPVTAGIFGSEGLVRAIFYDTGTTLMFTSLGLLLSHISGGEGSRIMK
RAVFFPPLWAFLLGVIFNLWGLPTGIAGTILGYLSGAAVPLIMISLGLTLNFRFLRHS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(3192. .5201)
/gene="MTH1881"
complement(3192. .5201)
/gene="MTH1381"
/gene="MTH1381"
/gene="MTH1381"
/gene="MTH1381"
/note="Function Code:10.08 - Metabolism of Macromolecules,
Protein translation and modification; similar to,
pir:LN:S48720 AC:S48720, p()=0, pid=88%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(5353. .6261)
/gene="MTH1382"
/note="Function Code:14.01 - Unknown, Conserved protein;
similar to, pir:LN:F64428 AC:F64428, p()=3.7E-20, pid=24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DGEKPKRVAFIHCVGSRDEQIGKPYCSRVCCMYIMKNAQLIKDKMPDTEVTLYYMDIR
AFGKGEEFYKRSQEKYGIKFINGRPAEILENPDLTTTVRSEDTLIGKVTEYDYDMVV
LGVGLVPPEGEKLKQVIGLSKSADGELMEAHPKLRPVDTLTDGVYLAGVAQGPKDIE
DAVAQASGAAARAAIPMVKGEVEIEPIVAVTDSDVCGGCEVCIELCPFGAISIEEGHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="Function Code:5.02 - L-Amino Acid Metabolism, Glycine--serine and threonine metabolism; similar to, sp:LN:GLYAA_METTH AC:P50436, p()=5.9E-203, pid=85%"
                                                    pid=51%"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APKMYDVGKHDNIELITYAEVKEYDGYIGNFKVKIEKKPRYIDEDLCTGCGSCVEVCP
IEMPNYFDEGIGMTKAVYIPFPQAVPLCATIDKDYCIECMLCDEICERGAVKHDQEPE
EIEIEVGTIIVATGYDAYDPTEKLEYGYGRHTNVITGLELERMINASGPTDGKVIKPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="MLDTPMQGDLMAEEKKEETMEEPRIGVYVCHCGVNIGGVVDIEA
VRDYAAKLPNVVVSKDYKYCSDPGQLEIQKDIKELGLNRVVVAACSPRLHEPTFRRC
VEDRACLNQFLFEFBAURERDOSWYHNDDPEGAFEKAKDLYRMAYAKARLLEPLEASKYS
VDDKALVIGGGVAGIQTALDLADMGFKTYMVEKRPSISGRMGQLDKTFPTLDCSMCIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(1738..3024)
/gene="MTH1380"
complement(1738..3024)
                                                                                                                                                                                                                       /gene="MTH1383"
                                                                                                                                                                                                                                                        complement(6276. .7211)
                                                                                                                                                                                                                                                                                     VDLVSSCIFMSTILSLVSLPLWSVVL"
                                                                                                                                                                                                                                                                                                                  VADATLVSGLRLLISPLMAAGISYVLAFRGLNFSVTVLEASMPSAMLAAVLAIENDLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="conserved protein"
/protein_id="AAB85859.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(5353. .6261)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NVNVALCKGCGTCVAACPSGAMDQQHFRTEQIMAQIEAALNEQAK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="heterodisulfide reductase, subunit A
/protein_id="AAB85858.1"
/db_xref="GI:2622491"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MDGKDVRDEVAEFMSSYTRVHYAFEDSEAYKYMEIQ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AEMLEFGAEYAAQTINNARKLAENLHELGFNVLCEHLDFTESHQVVMDVSDIGRAAEI
SKRLEANNIILNKNLLPWDDVNRSDDPSGIRIGTQEITRRGMKESEMSEVAEYIKRVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KKKILEVKPRIILFGGSLFLFPHPVEEALEAAEEVGARIMYDGAHVLGLIAGGYFQDP
LREGADMLVGSTHKTFPGPQGGIILCREELAADIDEAVFPGLVSNHHLHHVAGLGIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEALLSDLSHRYAEGLPGERLYEGCRYIDEIEELTIELSKRLFRAEHANVQPTSGVVA
NLACFFATAEVGDPIMAMEVPYGGHISHARVSAAGVRGFQIYTHPFDFENMNIDADAM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="serine hydroxymethyltransferase"
/protein_id="AAB85857.1"
/db_xref="GI:2622490"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PEDAIVPGVEIRLLSCRGCGACRTACPHGAVSGGRIITIHMREVDIRNTARLAAMDGI
RVFAKPGEILENMAHSHI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="MTH1382"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="MTH1380"
                          codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          translation="MEMIFMVSNQDYTEKIRQLMKDHNSWMESSINLIASENITSSRV/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 pid=24%"
                                                                                                                                   Q
                                                                                                                                                                                                                                                     Qγ
                       Q
                                                                                    밁
                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
                                                                                    6797
                                                                                                                                                                                                   6857
                                                                                                                                                                                                                                                                                                                                                                                                                                 6977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                                                                                                                            6917 ATAACCGAGGTTTTCGGAGAATTCGGGTCAGGTAAGAGTCAGCTGTCCCCATGAACTTGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                            472 gttactgagatcggtggcgtcccaggggttggtaaaactcaactggggattcaactagca 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             412 atcactactggttctggtgacctcaatgacatacttggtggcgggattcactgcaaagaa 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
atactggag 660
                                                                                                                                                                                                                                                  atcaatgtacaaatcccagtggaatgtggtggccttggtgggaaagcagtttatatagat 591
                                                                                    ACAGAGAACACATTCCGTCCTGAGAGGATTGAGCAGATAGCAAATGCCTTTGAACTTGAC
                                                                                                                                acagagggcagtttcatggttgaacgtgtctaccagattgctgaagggtgtattagggac 651
                                                                                                                                                                                                GTCACGGTTCAGCTGCCAGAGGAGAGGGGGAGGACTGGATGCTGAGGCTGTTTTCATAGAC
                                                                                                                                                                                                                                                                                                                                                                                                                           ATCACAACGGGGAGCAAGGCCCTCGATGAACTGATAGGTGGCGGAATCGAGACACAGGCA 6918
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             140;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(7775. .9643)
/gene="MTH1385"
complement(7775. .9643)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   pid=21%"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(7264. .7809)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="MTH1385"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="MTH1384"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(7264. .7809)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="MTH1384"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5.1%;
56.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 74.6; Db .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 13968;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
```

0;

Gaps

0;

6798

```
/product="replication factor A related protein"
/protein_id="AAB85862.1"
/db_xref="Gi:2622495"
/translation="MKEELKREYERIKDRISPEEFEELIEKKKEELGDIGFMDDLTIA
/translation="MKEELKREYERIKDRISPEEFEELIEKKKEELGDIGFMDDLTIA
/TVVDDILKEKNTMLSEKPEHRMDTISKLEEGGAETPVGGVMRKSSPRYFTTRKGREG
KLANVIIADDTGELRAVFMTENIKLLEKFEEGDVIRXKDVNIRGGFGGRKEAHLMRES
KLANVIIADDTGELRAVFMTENIKLLKKFEEGDVIRXKDVNIRGFGGRKEAHLMRES
TVEVLDPEDYPEEFPEYREEITPIGDLVEDDEVNVIARITGVSRVRTFERDGREGREIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="Function Code:10.09 - Metabolism of Macromolecules, DNA replication--modification--repair--and recombination; similar to, pir:LN:F64444 AC:F64444, p()=3.7E-31, pid=45% /codon_start=1 /crans1_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /translation="MKLSIGNSSRIEPASERDLEGLPSFDELQEMLYPHRDIADLDED SRNVLLEGELLEMSGRRILSIKCPSCNERLDLSDENICNFCGEL/DEPAYLLMIPGRI MDD7GEVMTPFGREABSILEMTDDEVVNIINQSADESALEERYEDLNGVTVRVIGNA DMDVYSEELRFIPRKVVKKEL"
                                                                                                                                                                                 LDIMDATGSTTYTLMNNDVNLVEELGLKEGDAVKILMAQPRRRDDKVTLTHTSLTRVV
PGEYOVPEFREELVKLGDLHEMRNVTWGLVTKVNDSVVBFERNDGTTGSVKSIELADD
TGSARVTLANDEDTRIKINKGOIIRISGANVEFDDFNQSYRINTNENTRITLNPSSDGA
LLKVLEEYREQMRPMKISEILEMEDEGEEVDVVGRIFSLSDPREFEREDGTGIVRSME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="Function Code:10.09 - Metabolism of Macromolecules, DNA replication--modification--repair--and recombination; similar to, pir:LN:F64444 AC:F64444, p()=0.0000042,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FGEFGSGKSQLSHELAVTVQLÞEERGGLDAEAVFIDTENTFRÞERIEQIANAFELDLE
EVLNKIHIARAFNSSHOILMAEKVNELIQEGKNIRLVIVDSLTAHFRAEYVGREALAT
RQQKLNQHLHTLQNIANTYNAAVFVTNQVQARÞDAFFGSÞTKAIGGHVLGHAATYRIW
EFADDTGSIRASLWDDAAEKPLSIGDPVKIENPRVVFRDDMGGGRLETQHRKQFKD"
9947. .11206
                                                                                   LADETGKIRISLWDEKAEKPMNIGDAVRIENARIRLGLYSVELSAGRTTRIVNPLPED
MEDLPSFEELEEMLYQTKKIADLEEDDRNIRIIARVVDLFEPREFQRGDGTPGLVRTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="replication factor A related protein"
/protein_id="AAB85861.1"
/db_xref="GI:2622494"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LKKGLAGKRIARLVDSPHLPEGECVFKITTAGIVD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation-"mveledlpnvgaktaqklrdagfgdmmrlatatakelsvkaeig
egvaekvieaarraekidfetafdvmerrkdvgrittgskaldeligggietqaitev
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="DNA repair protein RadA"
/protein_id="AAB85860.1"
/db_xref="GI:2622493"
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SSU45310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                밁
                                                                                                                                         Qy
                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                        Qy
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6737 CTTGAGGAG 6729
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              source
                                                                                                                                                                                                                                                                                                                                                                                                     538 AAAGAAGCGAGAGACGCATTAGATATAAGATTTAAGACGGCCCTGGAAGTCAAAAAGGAG 597
                                                                                                                                                                                                                                                                                                                                                                                                                                                   334 aatggaccacaacagaagtacgtttcaggagcccagaatgcctgggatatgttctctgat 393
                                                                                                                                                                                                                                               454 gggattcactgcaaagaagttactgagatcggtggcgtcccaggggttggtaaaactcaa 513
                                                                                                                                                                                                                                                                                                     598 AGAATGAACGTTAAGAAGATATCTACTGGTAGTCAAGCATTAGATGGTCTTTTAGCTGGA 657
                                                                                                                                                                                                                                                                                                                                                  394 gagctgtcacagaaacacatcactactggttctggtgacctcaatgacatacttggtggc 453
                                                                                                                                   514 ctggggattcaactagcaatcaatgtacaaatcccagtggaatgtggtgggccttggtggg 573
                             574 aaagcagtttatatagatacagagggcagttttcatggttgaacgtgtctaccagattgct 633
778 AAGGCAGTTTACATTGATACAGAAGGTACTTTCAGATGGGAAAGAATTGAAAATATGGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
                                                                                                                                                                                                    GGTATAGAAACTAGAACTATGACGGAATTCTTCGGTGAGTTTGGGTCTGGTAAAACACAG 717
                                                                                                CTATGTCATCAGTTAAGTGTTAATGTACAACTACCACCAGAGAAAGGTGGCTTATCTGGT 777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sulfolobus solfataricus radA gene, complete cds. U45310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Submitted (11-JAN-1996) Steven J. Sandler, Molecular and Cell Biology, University of California, 401 Barker Hall #3202, Ber CA 94720-3202, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sandler, S. J., Satin, L.H., Samra, H.S. and Clark, A.J. Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   recA-like genes from three archaean species with putative products similar to Rad51 and Dmc1 proteins of the yeast
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sandler, S.J., Satin, L.H., Samra, H.S. and Clark, A.J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sulfolobus solfataricus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       U45310.1 GI:1378035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Nucleic Acids Res. 24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Archaea; Crenarchaeota; Sulfolobales; Sulfolobaceae; Sulfolobus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sulfolobus solfataricus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Saccharomyces cerevisiae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (bases 1 to 1699)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 1 to 1699)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="Rada"
/product="Rada"
/protein_id="AAC44123.1"
/protein_id="AAC44123.1"
/protein_id="AAC44123.1"
/db_xref="GI:1378036"
/translation="MSNIEVEQKKNIKTINDLPGISQTVINKLIEAGYSSLETLAVASP
/translation="MSNIEVEQKKNIKTINDLPGISQTVINKLIEAGYSSLETLAVASP
ODLSVAAGIPLSTAQKIIKEARDALDIRFKTALEVKERMNVKKISTGSQALDGLLAG
ODLSVAAGIPLSTAQKIIKEARDALDIRFKTALEVKERMNVKKISTGSQALDGLLAG
GIETRTMTEFFGEFGSGKTQLCHQLSVNVQLPPEKGGLSGKAVYIDTEGTFERERIEN
MAKALGLDIDNVMNNIYYIRALNTDHJIAIVDDLQELVSKDPSIKLIVUDSVTSHFRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="
352. .1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EYPGREILAVRQQKLNKHLHQLTRLAETYDIAVIITNOVMARPDMEYGDETVAVGGHT
LYHVPGIRIQLKKSRGNRRIARVVDAPHLPEGEVVFALTEEGIRDAEE"
1 223 c 354 g 507 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Sulfolobus solfataricus"
/db_xref="taxon:2287"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="radA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="RecA-Rad51 homolog"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1699 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4.9%; Score 72; DB 3;
52.3%; Pred. No. 7.7e-07;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     radA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (11), 2125-2132 (1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches 145; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 1699;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              putative protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18-JUN-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Berkeley,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AP000058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                             gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      838 AAGG 841
                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   634 gaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      source
                                           gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Kawarabayasi,Y., Hino,Y., Horikawa,H., Yamazaki,S., Haikawa,Y., Jin-no,K., Takahashi,M., Sekine,M., Babb,S., Ankai,A., Kosugi,H., Hosoyama,A., Fukui,S., Nagai,Y., Nishijima,K., Nakazawa,Hu., Takamiya,M., Masudd,S., Funahashi,T., Tanaka,T., Kudoh,Y., Yamazaki,J., Kushida,N., Oguchi,A., Aoki,K., Kubota,K., Yamazaki,J., Nomura,N., Sako,Y. and Kikuchi,H. Complete genome sequence of an aerobic hyper-thermophilic crenarchaeon, Aeropyrum pernix Kl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Aeropyrum pernix genomic AP000058 BA000002 AP000058.1 GI:5103388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (14-DEC-1998) to the DDBJ/EMBL/GenBank databases. Yutaka Submitted (14-DEC-1998) to the DDBJ/EMBL/GenBank databases. Yutaka Kawarabayasi, National Institutte of Technology and Evaluation, Biotechnology Center; Nishihara 2-49-10, Shibuya-ku, Tokyo 151-0066, Japan (E-mail:kyutaka@kazusa.or.jp, Tel:+81-3-3481-8951,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Tanaka, T., Hino, Y., Kawarabayasi, Y. and Kikuchi, H.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Aeropyrum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AP000058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Fax: +81-3-3481-8424)
Fax: +81-3-3481-8424)
Kawarabayasi, Y. is officially affiliated with the National Kawarabayasi, Y. is officially affiliated with the National
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNA Res. 6 (2), 83-101 (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Aeropyrum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Aeropyrum pernix (strain:K1) DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         information are available at W.W.W. site of Biotechnology Center, URL: http://www.mild.nite.go.jp/.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Homology analysis is performed by Smith-Waterman algorithm against GenBank and GenPept release 109; EMBL release 56.0; SwissProt release 36.0; pIR-Protein release 57.0; and OWL release 31.0. E-mail address for comments and questions: genomeAPE@nite.go.jp Restriction map, ORF organization, sequence alignment and more
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The other authors are at the National Institute of Technology and The Other authors are at the National Institute of Technology and The Other 2-49-10 Nishihara, Shibuya, Tokyo 151-0066, Japan.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99310339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Archaea; Crenarchaeota; Desulfurococcales; Desulfurococcaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Evaluation, 2-49-10 Nishihara, Shibuya, Tokyo 151-0066, Japan.
All the sequence with length 100 codons or more between ATG or GTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Institute of Bioscience and Human-Technology, Tsukuba, Ibaraki
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             and stop codon are defined as CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            305-0046, Japan.
Nomura, N. and Sako, Y. are at Kyoto University, Sakyo-ku, Kyoto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (bases 1 to 202000)
                                                                                                                                                                                                                                                                                                                     complement(213. .938)
/gene="APE0001"
                                                                                                                                                                                                                                                                                                                                                                        complement(213. .938)
/gene="APE0001"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    pernix
                  complement(938. .1276)
/gene="APE0002"
                                                                   ILAGYTVELSVKRÞEAYVIPGLSRETIELLQFFMÞTSLSLIAIGVYMILAGFHMWWII
LLAGYTTLFVVTMLIMINKEGKY"
                                                                                                                                              /translation="MVDILSSLLLSLPFGVIGFLLVLSPGSIWTPVKESIGYVYVSRR
VTVKASKLLGSLTLLASLISFVVGAAYGITIQASTLALLLALLTVVTVEYSMRLAEIE
                                                                                                                                                                                            /product="241aa long hypothetical protein"
/protein_id="BAA78910.1"
/db_xref="GI:5103389"
                                                                                                                                                                                                                                                                                                                                                                                                                                                   /organism="Aeropyrum pernix"
/strain="K1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1. .202000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          202000 bp
                                                                                                                   SLNQPVLEGFEPVGSIKLKYLTIILLVYLISIVFSIEGSLKLYSIGAYGTLASHLSIE
                                                                                                                                                                                                                                                                                                                                                                                                                              /db_xref="taxon:56636"
                                                                                                                                                                                                                                                                       /transl_table=11
                                                                                                                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNA, section 1/7.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     06-APR-2000
```

```
CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                        /gene="APE0007"
3896. .5440
                                                                                                                                                                                                                  /translation="MLPLAVEQLTIAGSELLKHELTSKLVIGVLLSVWIVIVAVIKLR
KYSRNRQIVGLIVAAVATVVVLGTIAYIFNPLQTYGAYLESRTLQIRFYMNDEVAVDL
CNAQLSLLSRSNAINLLYIRTNGIADPFSGITAGYYKTVDEREAYVLIAGKDIDDVLA
                       /product="514aa long hypothetical protein"
/protein_id="BAA78916.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="APE0006"
2261. .2836
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /translation="MTLPRSLTFLSSMVKRYPLQPSSSPSATSAFMVTPAIRPSNISI
ITVVISRVVLDTSLKYPHGPILTPKALAIGNDITYEANGATADNMVHFKDGILILKIS
PIFSMLRYPSTHKAAITPVAGSHILNRRTIVRRSLFRGKVVVGSCIDVSNFMAIV"
                                                                     transl_table=11
                                                                                          /gene="APE0007"
/codon_start=1
                                                                                                                                                                                                      IEFDSKIILLGLKGANDFYQKLIIYKSSNCR"
                                                                                                                                                                                                                                                                                            /product="191aa long hypothetical protein"
/protein_id="BAA78915.1"
/db_xref="GI:5103394"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TLPRNKLLLTIVLLFRMWLPATGVIAALWVEGYRNMEKIKEILRINIPSLKWTILSAV
APLASYVMSLPIAKALGVSIGPCGYFKEVSNTTLLITTVIILILLGLIAGVTMNALVA
LGEELGWRGYLFTILDKKVNDLGKVIIIGLIWSVWHAPLIYAGYNYNVSMLGDCGSYS
QGWPAIVVFTLYTIAFTSILLPLRRHINSIITPAIAHGTVNGIGGVFAALTIGNRLVA
                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="157aa long hypothetical protein"
/protein_id="BAA78914.1"
/db_xref="GI:5103393"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="APE0005"
1618. .2091
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="304aa long hypothetical protein" -
/protein_id="BAA78913.1"
/db_xref="01:5103392"
/translation="MRIEIDKRHYIGLAVFLTVSFVPAYLLDYTIAIKLLTSMQEPTT
                                                                                                                                                                                                                                                                                                                                                                                                               /gene="APE0006"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="APE0005"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PPAGISVVVSMLIVGFLIKWWVSRGSSR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(1260. .2174)
/gene="APE0004"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="APE0004"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="motif=gram-positive cocci surface proteins
'anchoring' hexapeptide"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="MQAHQSLHPSSAYLLDPRDTHHEIRKPTISMETTTEIPAGGATS
LLPTVRAAKTPPIPLTVPCAIAGVMMEFECLLRGKRMLVNAMVYNVKTTIAGHPWE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="100aa long hypothetical protein"
/protein_id="BAA78912.1"
/db_xref="GI:5103391"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="112aa long hypothetical protein"
/protein_id="BAA78911.1"
/db_xref="G1:5103390"
/translation="MDPADKLMKDARTGVLALAVLHVLVNHGALHGYWLRKILGNLMG
WTPPETSLYDALKRLEKLGLIKGRWVRSGRGPLRKYYEITDAGRETYEVVVKDFSKMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="APE0003"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="APE0003"
1225. .1527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(938. .1276)
/gene="APE0002"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="similar to PIR:C69525 percent identity:39.583 in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             codon_start=1
                                 QΥ
                                                                                                                                                                       Matches 147;
                                                                                                                                                                                                               Query Match
                                                                                                                                                                                               Best
                                                                89207 CAAGACCGCTTACGACCTGAAGATCGAGAGCATGAACATTAAAAAGATTACGACGGGGAG 89266
                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                             gene
426 tggtgacctcaatgacatacttggtggcgggattcactgcaaagaagttactgagatcgg 485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                      366 ccagaatgcctgggatatgttctctgatgagctgtcacagaaacacatcactactggttc 425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                                                                                                                                                                                          Local Similarity
                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                /gene="APE0011"
8251. .8889
                                                                                                                                                                                                                                                        /gene="APE0011"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(6213. .7829)
/gene="APE0010"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement(6213. .7829)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(5774. .6091)
/gene="APE0009"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="APE0009"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="APE0010"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(5020. .5394)
/gene="APE0008"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(5020. .5394)
/gene="APE0008"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LSVALG"
                                                                                                                                                                                     4.8%;
                                                                                                                                                                0;
```

```
/translation="MPGLSARKGTEKLGFWEVFSIGVGGMIGGGIFATLGLSLELAGA ARPLAFILAGSVALITSYSYAKLSSRYPSEGGTIEFIVRAYGDNVISGGLNIMLLASY IVMISLYAHAFGSYGASMINCCPREAYIALVVEVIAGLITVVRHLGAINSGRVELGLVI FKLLVLILVAVVSMPLVDWNRLGVERPSILSITLFLAYEGFELVANTAKDFR DTTTLRKGLYASVUTVIIVYVLLAIVAAGTLDDTVRLARDYALAVLVEPVLGKIGFT LVVAAALASTSSAINATLYGSARVSYIIAKYGEAPQLLGRHIWRGAYEGLLVISILGL LVVAAALASTSSAINATLYGSARVSYIIAKYGEAPQLLGRHIWRGAYEGLLVISILGL LALYASLEQISTAGSGFLLIFAAVNLAAYKLRREFGANPLISLVGFILNITSLAIL
                                                                                                                                                                                                                                                                                                                                        ELNLPPSHPLHIHTVTRDKLENFKHKVKID"
                                                                                                                                                                                                                                                                                                                                                                  VYQMASMNPGELAILAVLIAGSMAAEALYRRIKGRRLPQVIDPSLKYRESLISGWRNL
TARAAEIIKREINNAEVYITGSIARGEYEKSGDIDLIVSTTKPLSPHEVKFIEERLVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="105aa long hypothetical transport protein"
/protein_id="BAA78918.1"
/db_xref="701:510397"
/translation="MNESWPYLKARMIIFKRHSQAILFSHNKQEKALLGIEGMHCEGC
AIAIETALKNYKGIIDTKVNYSRGSAIVTEDDTLVSINDILEHYIFKVPSNYRAKLVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="538aa long hypothetical protein"
/protein_id="BAA78919.1"
/db_xref="GI:5103398"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /db_xref="GI:5103395"
/tianslation="MRPWFDKRSVIVILVTMIAISGLIVVPLIVVPLIREGNTSEAS
EEGYPSPTNVETTVDSSDIKKTTSGRARISLSLGAQPENAIFSGKEFIYLVEDRKVDE
KEGHAKKYILRIIDLRSMTVETSVVIDEYSVSSGTGPCISEDGSGKEGYPSBYRLLGF
DGRYVYVARECPNTPLLYVVDLLNSRVVNTGIKTYWLAAVRDGVAYEYKDGTISATDV
VEGRVLMSHKLTPGYVFPEPGGFGRAFTGVLKGAWVDDNSLILLQDSDQATGELVWV
YSLVVASSEGVRESYLEAFRYKSDFASYDIRVGFDGRRVYLTGLIMSYRGAYGGVVT
RVEPPILVFETLTPEGEVLWAREIAVDIEQGKLLGFRENSLYFDGRYVYKMGPDRAA
RVEPPILVFETLTPEGEVLWAREIAVDIEQGKLLGFRENSLYFTDGRYVYKMGPDRAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="similar to OWL:PSMERTRP2 percent identity:45.455
44aa. motif=heavy-metal-associated domain"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           note="similar to PIR:E69471 percent identity:53.425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="MYNVVSTITITVVVSGVMKGRKGNSIGAAIIAPRTVSAESPWVPRSASFSAALSGPILYTYLPSVKYKLFSLNPRSFPCSMSTAISLAHRTSPSGVRVSNTSIGSTLVTVPVFTSMASTTFLHTA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="124aa long hypothetical protein"
/protein_id="BAA78917.1"
/db_xref="GI:5103396"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EKLADLGTQGLSADTVLGAIIAAPILFPFLPFITPDTTTVMVMVDTTLYIYNGPEAQL
Score 71.4; DB 2; Length 202000;
Pred. No. 1.4e-06;
0; Mismatches 126; Indels 0;
    0; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        'n
```

•		
; 1		
	·	
•		

```
GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.

OM protein - protein search, using sw model
Run on:
Cotober 1, 2001, 16:27:27; Search time 11.19 Seconds (without alignments)
900.010 Million cell updates/sec
Perfect score:
1530
Sequence:
1 MGDQSGSRNGPQQKYVSGAQ......VTGKGIRDAVSSNHKRARVT 294
Scoring table:
BLOSUM62
Gapop 10.0, Gapext 0.5
Searched:
93435 seqs, 34255486 residues
Total number of hits satisfying chosen parameters:
93435
Minimum DB seq length: 0
Maximum DB seq length: 200000000
Post-processing: Minimum Match 08
Maximum Match 1008
Listing first 45 summaries
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

Database :

SwissProt\_39:\*

## SUMMARIES

<b>3</b> 3	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	տ	4	ω	N	1		No.	1
199	206	209	217.5	241.5	272.5	٠	276	•		•		•	282.5		•	•	290	•	Ó	304	312	312	313	313	313	314.5	323	337	352.5	354.5	•	•		Score	
13.0	•	•		15.8	17.8	•	18.0	•	18.1	18.3	18.3	18.4	18.5	٠		18.8	•	•	•	19.9		0	0	20.5				2	23.0	ω		37.7		Match I	) d
212	221							339	400	339	336	339	336	339	343	339	342	332	339	324	352	345									324	376		Length DB	
1 R51L_METJA					1 RA51_LYCES			1 RA51_RABIT	1 RA51_YEAST	1 RA51_MOUSE	1 R512_XENLA	1 RA51_HUMAN	1 R511_XENLA	l RA51_CRIGR	1 RADA_HALVO	l RA51_CHICK	1 DMC1_ARATH	<pre>l DMC1_SCHPO</pre>	l RA51_USTMA	<pre>L DLH1_CANAL</pre>	L RADA_METJA	1 DMC1_SOYBN	•	1 DMC1_LILLO					1 RADA_METTH		1 RADA_SULSO	1 R51C_HUMAN	1	BID	
JA	ΈU	ISE	AN	ST	ES	ME	IPO	TT.	ST	ISE	ILA	AN	ILA	GR	vo	CK	TH	IPO	MA	7AL	JA	BN	ISE	O	AN	E	AN	ST	HT	FU	OS	AN			
Q57702	028184	055230	075771	P25301	Q40134	Q27297	P3660,1	077507	P25454	Q08297	091917	206609	Q91918	P70099	Q48328	P37383	Q39009	042634	Q99133	P50265	Q49593	096449	035719	P37384	014565		015315	P25453	027436	029269	Q55075	043502		Description	
methanococc		mus musculu	homo sapien	saccharomyc	lycopersico	drosophila	schizosacch	oryctolagus	saccharomyc	a	xenopus		xenopus :	cricetulus	halobacter	gallus gal	arabidopsis	schizosacch	ustilago ma	candida a	methanococc	glycine max	mus musculu	⋾	0	mus musculu	homo sapien	saccharomyc	methanobact	archaeoglob	2	homo sap:		i i on	
၁ငင	dol	ulu	ien	nyc	ico	la	ch	sug	пус	ulu	lae	ien	lae	ST	eri	116	sis	cch	ma	alb	000	nax	ulu	long	ien	uLu	ien	ηVC	act	lob	su	apien	-		

Qy Qy

140 ADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFEDLALRTRVLSGL 199

82 EC-GGLGGKAVYIDTEGSFMVERVYQIAEGCIRDI-LEHFPHSHEKSSSVQKQLQPERFL 139 || ||: |:||:|||||||| || ||: | | |: | |: | 146 ECFGGVAGEAVFIDTEGSFMYDRVVDLATACIQHLQLIAEKHKGEEHRKALEDFTLDNIL 205

45	44	43	42	41	40	39	38	37	36	35	34
117.5	117.5	117.5	118	125.5	127.5	133	134.5	164.5	174.5	189	199
7.7	7.7	7.7	7.7	8.2	8.3	8.7	8.8	10.8	11.4	12.4	13.0
480	453	448	343	458	406	458	452	350	216	234	228
1	1	μ.	<b></b>	ш	μ	⊢	-	٢	1	ר	₽
RADA_MYCTU	RADA_PSEAE	RADA_RICPR	RECA_XANCP	RADA_HAEIN	RA55_YEAST	RADA_BACSU	RADA_LISMO	RH55_SCHPO	R51L_METMP	R51L_METTH	R51L_PYRHO
_	P96963 pseudomonas			P45266 haemophilus					O50248 methanococc		057859 pyrococcus

## ALIGNMENTS

Qy Db	X III O	SQ	KW	DR	DR DR	200	188	38	22	88	88	38	റ്റ	38	38	RL	RT	<b>2</b> 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	R A	Į X	RP	RN	2 8	8	SO	ON E		DT	DT	AC t	RES
22 AWDMFSDELSOKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPV 81   :	Query Match 37.7%; Score 576.5; DB 1; Length 376; Best Local Similarity 43.9%; Pred. No. 2.2e-42; Matches 125; Conservative 47; Mismatches 98; Indels 15; Gaps 4;	NF_BIND 123 132 ATF (POTENTIAL). SEQUENCE 376 AA; 42189 MW; 3AAADD3C1C0851E0 CRC64;	ding; ATP-binding;	ITE; PS5	EMBL; AF029669; AAC39604.1;	or send an email to license@isb-sib.ch).	entities requires a license agreement (See http://www.isb-sib.ch/announce/	Is its o	the European Bioinformatics Institute. There are no restrictions on its	between the Swiss Institute of Bioinformatics and the EMBL outstation	This SWISS-PROT entry is copyright. It is produced through a collaboration	PROKARYOTIC	TO OTHER E	HIGHEST EXPRESSION IN TESTIS, HEART MUSCLE, SPLEEN AND PROSTATE.	SUBCELLULAR LOCATION: NUCLEAR (PROBABLE).	Nucleic Acids Res. 26:1179-1184(1998).		"Isolation and characterization of RAD51C, a new human member of the	Schild D	Townson of the townson	SEQUENCE FROM N.A.	NCB1_1dX1D=9606;	ia; Primates;	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;	Homo sapiens (Human).	RAD51L2 OR RAD51C.	, 0	15-DEC-1998 (Rel. 37, Last sequence update)	1998	043502;	מיינייניינייניינייניינייניינייניינייניינ

```
RESULT RESULT REPORTED TO THE PROPERTY OF THE 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρ
                                           Ş
                                                                                                     В
                                                                                                                                                 Qy
                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
밁
                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NP_BIND
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROSITE; PS50162; RECA_2; 1. PROSITE; PS50163; RECA_3; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; U45310; AAC44123.1; -. HSSP; P03017; 2REB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-NOV-1997
15-DEC-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RADA_SULSO Q55075;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SULSO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         entities requires a license agreement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=96251095; PubMed=8668545;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RADA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DNA damage; DNA recombination; ATP-binding; DNA-binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=2287;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Archaea; Crenarchaeota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   260
219
                                                    185
                                                                                                        170
                                                                                                                                                                                                          119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          206
                                                                                                                                                         125
                                                                                                                                                                                                                                                              65
                                                                                                                                                                                                                                                                                                                59
                                                                                                                                                                                                                                                                                                                                                                    13 QKYVSGAQNAWD------MFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGV 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LDKSPSLPVASAPYAVTGKGIRDAV------SSNHKRAR 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AQQMISLANNHRLAVILTNQMTTKIDRNQALLVPALGESWGHAATIRLIFHWDRKQRLAT 325
                                                 DF---EDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLAL-GDSWS
                                                                                                                                                   KSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQ 184
                                                                                                                                                                                                                                                         GKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHE 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LYKSPSQKECTVLFQIKPQGFRDTVVTSACSLQTEGSLSTRKRSR 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDSWSHSCTNRLILHWNGNERYAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SHIYYFRCRDYTELLAQVYLLPDFLSEHSKVRLVIVDGIAFPFRHDLDDLSLRTRLLNGL
EYPGREILAVRQQKLNKHLHQLTRLAEVYDIAVIITNQVMARPDMFYGDPTVAVGGHTLY
                                                                                                                                                                                                          GKTQLCHQLSVNVQLPPEKGGLSGKAVYIDTEGTFRWERIENMAKALGLDI------
                                                                                                                                                                                                                                                                                                                  QKIIKEARDALDIRFKTALEVKKERMNVKKISTGSQALDGLLAGGIETRTMTEFFGEFGS
                                                                                                                                                                                                                                                                                                                                                                                                                        97;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                     -----DNVMNNIYYIRAINTDHQIAIVDDLQELVSKDPSIKLIVVDSVTSHFRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            solfataricus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Rel. 35, Last sequence up (Rel. 37, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          35, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121 35866 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                             25.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sulfolobales;
                                                                                                                                                                                                                                                                                                                                                                                                                     61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FP (POTENTIAL).
B08CA699AA404A88 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                   No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sulfolobaceae; Sulfolobus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                   .5e-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                        33
;
                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
278
                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            265
                                                                                                     218
                                                                                                                                                                                                                                                                                                                                                                                                                        5
```

```
δã
                                                                                     밁
                                                                                                                                     Ωy
                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 3
RADA_ARCFU
                                                                                                                                                                                                                                                                                                       Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Klenk H.-P., Clayton R.A., Tomb J.-F., White O., Nelson K.E., Ketchum K.A., Dodson R.J., Gwinn M., Hickey E.K., Peterson J.D., Richardson D.L., Kerlavage A.R., Graham D.E., Kyrpides N.C., Fleischmann R.D., Quackenbush J., Lee N.H., Sutton G.G., Gill S. Kirkness E.F., Dougherty B.A., McKenney K., Adams M.D., Loftus B. Peterson S., Reich C.I., McNeil L.K., Badger J.H., Glodek A., Zhoverbeek R., Goosyne J.D., Weidman J.F., McDonald L., Utterback Cotton M.D., Spriggs T., Artiach P., Kaine B.P., Sykes S.M., Sadow P.W., D'Andrea K.P., Bowman C., Fujii C., Garland S.A., Mason T.M., Olsen G.J., Fraser C.M., Smith H.O., Woese C.R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         use by non-profit institutions as long modified and this statement is not removed: entitles requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       O29269;
15-DEC-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                          DNA damage; DNA recombination; NP_BIND 115 122 AV SEQUENCE 337 AA; 37162 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PROSITE; PS50162; RECA_2; 1. PROSITE; PS50163; RECA_3; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; AE001035; AAB90248.1; TIGR; AF0993; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    reducing archaeon Archaeoglobus fulgidus.", Nature 390:364-370(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Archaea; Euryarchaeota; Archaeoglobales; Archaeoglobus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RADA OR AF0993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 15-DEC-1998
15-DEC-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RADA_ARCFU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "The complete genome sequence of the hyperthermophilic, sulphate-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=98049343; PubMed=9389475;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN=VC-16 / DSM 4304 / ATCC 49558;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=2234;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Archaeoglobus fulgidus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNA REPAIR PROTEIN RADA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Venter J.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                        131
                                                                                                                                                                                              71
                                                                                                                                                                                                                                                    16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  s SWISS-PROT entry is copyright. It is produced through ween the Swiss Institute of Bioinformatics and the EN European Bioinformatics Institute. There are no restricted the state of the swind of the swind swind swinds and the swind swind swinds and the swinds are swinds as a swind swind swinds are swinds as a swind swind swind swinds are swinds as a swind swind swind swinds are swinds as a swind swind swind swind swinds are swinds as a swind swind swind swind swind swinds are swinds as a swind swind swind swind swind swinds are swinds as a swind 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RECOMBINATION AND REQUIRED FOR MEIOTIC RECOMBINATION.
SIMILARITY: STRONG TO EUKARYOTIC RECA-LIKE PROTEIN; SOME, TO PROKARYOTIC RECA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FUNCTION: PROBABLY INVOLVED IN DNA REPAIR AND IN HOMOLOGOUS
ERFLADIYYFRICSYTEQIAVIN----YMEKFLREHKDVRIVIIDSVTFHFRQDF---ED
                                                                                        NVQLPEDEGGLEGSVIIIDTENTFRPERIIQMAEA----
                                                                                                                                                                                                                                              VSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAI 75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HVPGIRIQLKKSRGNRRIARVVDAPHLPEGEVVFALTEEGIRDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HSCTNRLILHWN-GNERYAHLDKSPSLPVASAPYAVTGKGIRDA
                                                                                                                                  NVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQP 135
                                                                                                                                                                                              IGGFESGDKVLERRRSVKKITTGSKDLDELLGGGVETQAITEFFGEFGSGKTQICHQLAV 130
                                                                                                                                                                                                                                                                                                             95;
                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (Rel. 37, Last sequence up (Rel. 37, Last annotation
                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
                                                                                                                                                                                                                                                                                                                                   23.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Created)
                                                                                                                                                                                                                                                                                                             50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      n; ATP-binding; DNA-binding ATP (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                   Score 354.5;
Pred. No. 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                               7888592BAA3BDF43
                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                      .6e-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Archaeoglobaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 as its content
                                                                                                                                                                                                                                                                                                                                                                   DΒ
                                                                                                                                                                                                                                                                                                             105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        283
                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                             Length 337;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ьу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        restrictions on
                                                                                        -----KGLDG 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Loftus B.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a collaboration
                                                                                                                                                                                                                                                                                                             43;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Zhou L.,
                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          commerc
                                  188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ņ
                                                                                                                                                                                                                                                                                                             6
```

```
δõ
                                                                                                                                             Qy
                                                                                                                                                                                                           밁
                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 4
RADA_METTH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Complete genome sequence of Methanobacterium thermoautotrophicum deltaH; functional analysis and comparative genomics.";
J. Bacteriol. 179:7135-7155(1997).
-i- FUNCTION: PROBABLY INVOLVED IN DNA REPAIR AND IN HOMOLOGOUS RECOMBINATION AND REQUIRED FOR MEIOTIC RECOMBINATION.
-i- SIMILARITY: STRONG TO EUKARYOTIC RECA-LIKE PROTEIN; SOME, TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Aldredge T., Bashirzadeh R., Blakely D., Cook R., Gilbert K., Harrison D., Hoang L., Keagle P., Lumm W., Pothier B., Qiu D., Spadafora R., Vicare R., Wang Y., Herzbowski J., Gibson R., Jiwani N., Caruso A., Bush D., Safer H., Patwell D., Prabhakar McDougall S., Shimer G., Goyal A., Pietrovski S., Church G.M., Boniels C.J., Mao J.-I., Rice P., Nolling J., Reeve J.N.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNA damage; DNA recombination; ATP-binding; DNA-binding NP_BIND 104 111 ATP (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; AE000901; AAB85860.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the European
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Aldredge T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=145262;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Methanobacterium thermoautotrophicum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RADA OR MTH1383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           027436;
15-DEC-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RADA_METTH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=98037514;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Archaea;
                                                                                            106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15-DEC-1998 (Rel.
15-DEC-1998 (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        171
                                                                                                                                                       62
                                                                                                                                                                                                              46
                                                                                                                                                                                                                                                                      10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SIMILARITY: STRONG TO EUK. PROKARYOTIC RECA PROTEIN.
                                                                                                                                                                                                                                                               GPQQKYVSGA-----QNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGV
                              SHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFH
                                                                                      FGSGKSQLSHELAVTVQLPEERGGLDAEAVFIDTENTFRPERIEQIANAF------
                                                                                                                                             PGVGKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPH 121
                                                                                                                                                                                                        GVAEKVIEAARRAEKIDFETAFDVMERRKDVGRITTGSKALDELIGGGIETQAITEVFGE 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SWISS-PROT entry is copyright. It is produced through a collaboration sen the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HTATFRIYLKKGKDDLRIARLIDSPHLPEGEAIFRVTERGIEDAEEKDKKKRK 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HSCTNRLILHWNGNE-RYAHLDKSPSLPVASAPYAVTGKGIRDAVSSNHKRAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LADRQQKLNRHLHDLMKFGELYNAAIVVTNQVMAR-----PDVLFGDPTKPVGGHIVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NEVLKNIYVAQAYNSNHQMLLVDNAKELAEKLKKEGRPVRLIIVDSLMSHFRAEYVGRGT 230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDSW-----S 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                D.R., Doucette-Stamm L.A., Deloughery C., Lee H.-M.,
                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PS50162; RECA_2; PS50163; RECA_3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             pean Bioinformatics Institute. There non-profit institutions as long as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Euryarchaeota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 311 AA;
                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       37, Created)
37, Last sequence of the sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PubMed=9371463;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 34125 MW;
                                                                                                                                                                                                                                                                                                                                                            23.0%;
33.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Methanobacteriales; Methanobacteriaceae;
..
                                                                                                                                                                                                                                                                                                                             46;
                                                                                                                                                                                                                                                                                                                                                            Score 352.5;
Pred. No. 3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3A0DF609A98785DB CRC64;
                                                                                                                                                                                                                                                                                                                             Mismatches 111;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   311
                                                                                                                                                                                                                                                                                                                                                            3.5e-23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         There are no
•••
                                                                                                                                                                                                                                                                                                                                                                                        DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                its content
-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and the
                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Prabhakar S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         restrictions
                                                                                                                                                                                                                                                                                                                                                                                        311;
                                                                                                                                                                                                                                                                                                                             33,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Dubois
                                 181
                                                                                                                                                                                                                                                                                                                          G
```

```
RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DMC1_YEAST
                                                                                                                                                                                           Aviles E., Berno A., Brennan T., Carpenter J., Chen E., Cherry Chung E., Duncan M., Guzman E., Hartzell G., Hunicke-Smith S., Hyman R., Kayser A., Komp C., Lashkari D., Lew H., Lin D., Mosedale D., Nakahara K., Namath A., Norgren R., Oefner P., Oh (Petel F.X., Roberts D., Sehl P., Schramm S., Shogren T., Smith V. Taylor P., Wei Y., Yelton M., Botstein D., Davis R.W.; Submitted (DEC-1994) to the EMBL/GenBank/DDBJ databases.
-i- FUNCTION: REQUIRED FOR MEIOTIC RECOMBINATION, SYNAPTONEMAL C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DMC1_YEAST P25453;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=92257586; PubMed=1581960;
Bishop D.K., Park D., Xu L., Kleckner N.;
"DMC1: a meiosis-specific yeast homolog o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DMC1 OR ISC2 OR YER1/yw.

DMC1 OR ISC2 OR YER1/yw.

Saccharomyces cerevisiae (Baker's yeast).

Saccharomyceta; Saccharomycotina; Saccharomycetes;

Pinkarvota; Fungl; Ascomycota; Saccharomyces.
                                                                                                                                                                                                                                                                                                                        STRAIN-S288C / AB972;
Dietrich F.S., Mulligan J.T., Hennessey K.M., Allen E.,
                                                                                                                                                                                                                                                                                                                                                                                 Mulligan J.T., Dietrich F.S., Hennessey K.M., Sehl P., Wei Y., Taylor P., Nakahara K., Roberts D., Davis R.W.; Submitted (FEB-1993) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Kobayashi T., Hotta Y., Tabata S.;
"Isolation and characterization of a yeast gene that is homologous with a melosis-specific CDNA from a plant.";
                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=93204898; PubMed=8455558;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 progression."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "DMC1: a meiosis-specific yeast homolog of E. recombination, synaptonemal complex formation,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-MAY-1992
01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEIOTIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-MAY-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               266
                                                                                                                        SIMILARITY: PROKARYOTIC
                                                                                                                                                                                   SUBCELLULAR LOCATION:
                                                                                                                                                                  DEVELOPMENTAL
                                                                                                                                                      MEIOSIS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    69:439-456(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gen. Genet.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VLGHAATYRIWLKKGLAGKRIARLVDSPHLPEGECVFKITTAGIVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FRAEYVGREALATRQQKLNQHLHTLQNIANTYNAAVFVTNQVQARPDAFFGSPTKAIGGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -WSHSCTNRLILHWN-GNERYAHLDKSPSLPVASAPYAVTGKGIRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----ELDLEEVLNKIHIARAFNSSHQILMAEKVNELIQEGKNIRLVIVDSLTAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1992 (Rel. 22, Last sequence up
1997 (Rel. 35, Last annotation
RECOMBINATION PROTEIN DMC1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDS 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                       STRONG TO OTHER EUKARYOTIC RECA-LIKE PROTEIN; RECA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                        237:225-232(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22,
22,
35,
                                                                                                                                                                   STAGE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Created)
                                                                                                                                                                   EXPRESSED
                                                                                                                                                                                   NUCLEAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRT;
                                                                                                                                                                  2.5 HOURS AFTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              coli
, and
                                                                                                                                                                                                                                                                                                                                                                                   databases
                                                                                                                                                                                                           SYNAPTONEMAL COMPLEX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              recA
                                                                                                                                                                   INDUCTION
                                                                                                                                                                                                                                                                                                                                                                                                             Komp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             required cycle
                                                                                                                                       SOME,
                                                                                                                                                                                                                                                                                                            J.M.,
                                                                                                                                                                                                                                                    ۲.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    265
                                                                                                                                       70
```

use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).

s SWISS-PROT entry is copyright. It is produced through ween the Swiss Institute of Bioinformatics and the EN European Bioinformatics Institute. There are no resti

restrictions

9

EMBL

outstation

collaboration

```
RESULPH RESULP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL;
EMBL;
EMBL;
PIR;
PIR;
PIR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        O15315; O60914;
15-DEC-1998 (Rel. 37, Created)
15-DEC-1998 (Rel. 37, Last sequence update)
O1-OCT-2000 (Rel. 40, Last annotation updat
DNA REPAIR PROTEIN RAD51 HOMOLOG 2 (R51H2).
RAD51L1 OR RAD51B OR REC2.
                        MEDLINE=98181067; PubMed=9512535;
Cartwright R., Dunn A.M., Simpson P.J., To
"Isolation of novel human and mouse genes
recombination-repair gene family.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A. (1ST FORM).

MEDITINE-97352813; PubMed-9207106;

Rice M.C., Smith S.T., Bullrich F., Havre P., Kmiec E.B.;

"Isolation of human and mouse genes based on homology to REC

recombinational repair gene from the fungus Ustilago maydis.

Proc. Natl. Acad. Sci. U.S.A. 94:7417-7422(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Homo sapiens (Human).
Eukaryota; Metazoa; Chordata;
Mammalia; Eutheria; Primates;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROSITE; PS50162; RECA_2; 1.

PROSITE; PS50163; RECA_3; 1.

Sporulation; Meiosis; Cell cycle; ATP-binding; Nuclear protein.

NP_BIND 121 128 ATP (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A. (1ST FORM).
MEDLINE=98110585; PubMed=9441753;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R51B_
                                                                                                                                                                       SEQUENCE FROM N.A. (2ND FORM)
   Nucleic
                                                                                                                                                                                                                                                                                                                                           Albala J.S., Thelen M.P., Prange
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=9606;
                                                                                                                                                                                                                                                                       Thompson L.H., Lennon G.G.; "Identification of a novel human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LL; M87549; AAA34571.1; D10865; BAA01637.1; LL; U18922; AAB64706.1; S30857; S30857; S30857; S30276; S30276; S30276; A38214; A3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AVINYMEKFLREHKDVRIVIIDSVTFHFRQDF---EDLALRTRVLSGLSLKLMKIAKTYN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LSTGSKQLDSILGGGIMTMSITEVFGEFRCGKTQMSHTLCVTTQLPREMGGGEGKVAYID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PSLPVASAPYAVTGKGIRDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VAVFLTNQVQS--DPGASALFASADGRKPIGGHVLAHASATRILLRKGRGDERVAKLQDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LAVVLLNQVTTKFTEGSFQLTLAL-----GDSWSHSCTNRLILH-WNGNERYAHLDKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQI 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PDMPEKECVYVIGEKGITDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ELVEQLGEEL-SSGDYRLIVVDSIMANFRVDYCGRGELSERQQKLNQHLFKLNRLAEEFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TEGTFRPERIKQIAEG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                       46:476-479(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ā,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
   26:1653-1659(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        36612 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . . . .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Craniata; Vertebrata; Euteleostomi; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OOB0503D7FAF5CB3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                           C.K.,
                                                                                                                                                                                                                                                                       RAD51 homolog,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ي 337;
8.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----YELDPESCLANVSYARALNSEHQM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             update)
                                                                                                                                                                                                                                                                                                                                           Fan W.,
                                                                   Tambini C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 1;
.2e-22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    93;
                                                                                                                                                                                                                                                                                                                                              Christensen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                  RAD51B.";
                                                                       recA/RAD51
                                                                                                       Ē
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                       Thacker J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REC2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6;
```

```
DMC1
                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                           γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SO THE
В
                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                              Q61880;
01-NOV-1997
01-NOV-1997
30-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entropean Bioinformatics Institute. There are no restude by non-profit institutions as long as its content
                                                                                                                                                                                 METOTIC RECOMBINATION PROTEIN DMC1 OR DMC1H OR LIM15.
                                                                                                                                                                                                                                                                    MOUSE
DMC1_MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA-binding; ATP-binding; Nuclear protein; Alternative splicing.

NP_BIND 108 115 ATP (POTENTIAL).

VARSPLIC 346 350 AV: 38257 MW; CEA992DDC394F3B0 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; U92074; AAB63358.1;
EMBL; U84138; AAC39723.1;
EMBL; Y15571; CAA75680.1;
MIM; 602948; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   + +
                            testis.";
                                                     Sato
                                                                    MEDLINE=96038268; PubMed=8581742;
                                                                                  TISSUE=Testis;
                                                                                                                                           Mammalia;
                                                                                                                                                       Eukaryota; Metazoa;
                                                                                                                                                                    Mus musculus (Mouse)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PROSITE;
                                                                                              SEQUENCE FROM N.A.
                                                                                                              NCBI_TaxID=10090;
[1]
                                        Sato S., Kobayashi T., Hotta Y., Tabata
"Characterization of a mouse recA-like
                                                                                                                                                                                                                                                                                                                                                                                                                                                          188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 135
                                                                                                                                                                                                                                                                                                                                                                      236
                                                                                                                                                                                                                                                                                                                                                                                                   237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     143
                                                                                                                                                                                                                                                                                                                                          297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SUBCELLULAR LOCATION: NUCLEAR (PROBABLE).
ALTERNATIVE PRODUCTS: AT LEAST 2 ISOFORMS; 1 (SHOWN HERE)
ARE PRODUCED BY ALTERNATIVE SPILICING.
TISSUE SPECIFICITY: EXPRESSED IN A WIDE RANGE OF TISSUES.
SIMILARITY: STRONG TO OTHER EUKARYOTIC RECA-LIKE PROTEIN;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PROKARYOTIC RECA PROTEIN.
                                                                                                                                                                                                                                                                                                                                        GNTWSHSVNTRLILOYLDSERRQILIAKSPLAPFTSFVYTIKEEGL 342
                                                                                                                                                                                                                                                                                                                                                                     GDSWSHSCTNRLILHWNGNERYAHL-DKSPSLPVASAPYAVTGKGI 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE-----DLALRTRVLS 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                         VLQRIESLEEEII--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EGAVVYIDTESAFSAERLVEIAE-----SRFPRYFNTEEKLLLTSSKVHLYRELTCDE 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP---HSHEKSSSVQKQLQPERFL-ADI 142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SADFSPAFLSTTLSALDEALHGGVACGSLTEITGPPGCGKTQFCIMMSILATLPTNMGGL 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGL 86
                                                                                                                                                                                                                                                                                                                                                                                                   REASSLKYLAEEFSIPVILTNQITTHLSGALASQADLVSPADDLSLSEGTSGSSCVIAAL
                                                                                                                                                                                                                                                                                                                                                                                                                           GLSLKLMKIAKTYNLAVVLLNQVTTKF-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PS50162; RECA_2;
           2:147-150(1995).
                                                                                                                                           Eutheria;
                                                                                                                                                                                                              (Rel. 35, (Rel. 35, Rel. 39,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                     STANDARD;
                                                                                                                                         Chordata;
Rodentia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           21.1%; 32.2%;
                                                                                                                                                                                                              Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                            -----SKGIKLVILDSVASVVRKEFDAQLQGNLKERNKFLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 323;
Pred. No. 1
                                                                                                                                         Craniata; Vertebrata;
Sciurognathi; Muridae;
                                                                                                                                                                                               notation update)
DMC1/LIM15 HOMOLOG
                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                        Tabata
                                                                                                                                                                                                                                                                       340
                                        gene
                                                        s.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .4e-20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               100;
                                         specifically
                                                                                                                                           Muridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                               ----TEGSFQLTLAL 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                           Euteleostomi;
                                                                                                                                           Murinae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL
                                         expressed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOME,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                            236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ဝ္ဂ
                                            ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ö
```

```
RP OC OC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                       RESULT 8
DMC1_HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                            DMC1_HUMAN STANDARD; PRT; 340 AA. 014565; 099498; 01-NOV-1997 (Rel. 35, Created) 01-NOV-1997 (Rel. 35, Last sequence update) 01-OCT-2000 (Rel. 40, Last annotation update) MC1OTIC RECOMBINATION PROTEIN DMC1/LIM15 HOMOLOG. DMC1 OR DMC1 OR LIM15.
                                                                                 Homo sapiens (Human).
Eukaryota; Metazoa; Chordata;
Mammalia; Eutheria; Primates;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGD; MGI:105393; DWGL...,
AGD; MGI:105393; DWGL...,
PROSITE; PS50162; RECA_2; 1.
PROSITE; PS50163; RECA_3; 1.
Meiosis; Cell cycle; ATP-binding; Nuclear protein.
Meiosis; Cell cycle; ATP-binding; Nuclear protein.
Meiosis; Cell cycle; ATP-dinding; Nuclear protein.
Meiosis; M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Habu T., Taki T., West A., Nishimune Y., Morita T.;
"The mouse and human homologs of DMC1, the yeast meiosis-specific homologous recombination gene, have a common unique form of exonskipped transcript in meiosis.";
skipped transcript in meiosis.";
ucleic Acids Res. 24:470-477(1996).
"I- FUNCTION: MAY PARTICIPATE IN MEIOTIC RECOMBINATION."
"I- SUBCELIGUAR LOCATION: NUCLEAR (POTENTIAL)."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bicinformatics and the EMBL outstation - the European Bicinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; D58419; BAA09590.1; -. EMBL; D64107; BAA10969.1; -. HSSP; P03017; 2REB.
                                                        NCBI_TaxID=9606;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      or send
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
STRAIN=129/SV; TISSUE=Testis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=96173646; PubMed=8602360;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  34 HITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYI 93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIMILARITY: STRONG TO OTHER EUKARYOTIC RECA-LIKE PROTEIN; PROKARYOTIC RECA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KSPSLPVASAPYAVTGKGIRDA 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DSPEMPENEATFAITAGGIGDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        YNVAVFVTNQMT----ADPGATMTFQADPKKPIGGHILAHASTTRISLRKGRGELRIAKIY 316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YNLAVVLLNQVTTKFTEGSFQLTLAL-----GDSWSHSCTNRLILH-WNGNERYAHLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MELLDYVAAKFHEEAGIFKLLIIDSIMALFRVDFSGRGELAERQQKLAQMLSRLQKISEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IAVINYM-EKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLMKIAKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HITTGSQEFDKLLGGGIESMAITEAFGEFRTGKTQLSHTLCVTAQLPGTGGYSGGKIIFI 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DTENTFRPDR-----LRDIADRFNVDH------EAVLDNVLYARAYTSEHQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    s requires a license agreement (See http://www.isb-sib.ch/announce/
an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                             Chordata;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    43;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 314.5; D
Pred. No. 7.3e-
                                                                                    Catarrhini;
                                                                                                                Craniata; Vertebrata; Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                       Hominidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 340;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOME,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TO
```

```
RESULT 9
DMC1_LILLO
ID DMC1_L
AC P37384
DT 01-OCT
DT 01-OCT
DT 01-NOV
                                                                                                                                                           밁
                                                                                                                               ρy
                                                                                                                                                                                 Qy
                                                                                                                                                                                                           밁
                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local 9
                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                     CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                             MIM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sato S., Seki N., Hotta Y., Tabata S.;
"Expression profiles of a human gene identified as a structural homologue of meiosis-specific recA-like genes.";
DNA Res. 2:183-185(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; D63882; BAA09932.1; -. EMBL; D64108; BAA10970.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TISSUE=Testis;
MEDLINE=96127532; PubMed=8590282;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=96173646; PubMed=8602360;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                            307
                                                                                                                                 252
                                                                                                                                                           250
                                                                                                                                                                                                          190
                                                                                                                                                                                                                                  144
                                                                                                                                                                                                                                                          150
                                                                                                                                                                                                                                                                                  84
                                                                                                                                                                                                                                                                                                          90
                                                                                                                                                                                                                                                                                                                                 29
                                                                                                                                 NGNERYAHLDKSPSLPVASAPYAVTGKGIRDA 283
                                                                                                                                                                                SLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLAL-----GDSWSHSCTNRLILH-W
                                                                                                                                                                                                                              YFRICSYTEQIAVINYM-EKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGL 199
                                                                                                                                                                                                                                                                                                       EYSEKRKMVFHITTGSQEFDKLLGGGIESMAITEAFGEFRTGKTQLSHTLCVTAQLPGAG 149
                                                                                                                                                                                                                                                                                                                               ELSQK-----HITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVEC 83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           602721;
                                                                                                          RGELRIAKIYDSPEMPENEATFAITAGGIGDA
                                                                                                                                                         LSRLQKISEEYNVAVFVTNQMT----ADPGATMTFQADPKKPIGGHILAHASTTRISLRKG
                                                                                                                                                                                                        YARAYTSEHQMELLDYVAAKFHEEAGIFKLLIIDSIMALFRVDFSGRGELAERQQKLAQM
                                                                                                                                                                                                                                                       GYPGGKIIFIDTENTFRPDR------LRDIADRFNVDHDP------VLDNVL 189
                                                                                                                                                                                                                                                                              GGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIY 143
                                                                                                                                                                                                                                                                                                                                                          , 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     P03017; 2REB.
                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                      340
                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                      AA;
                                                                                                                                                                                                                                                                                                                                                                                                                      37707 MW;
                                                                                                                                                                                                                                                                                                                                                                     20.5%;
                                                                                                                                                                                                                                                                                                                                                        45;
                                                                                                                                                                                                                                                                                                                                                                    Score 313;
Pred. No. 9.
                                                                                                                                                                                                                                                                                                                                                                                                                     EBBBDE57EB440402 CRC64;
                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                     DB 1;
.8e-20;
                                                                                                                                                                                                                                                                                                                                                                              Length 340;
                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                       40;
                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                       249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                70
                                                                                                                                                                                                                                                                                                                                                       8
```

01-OCT-1994 01-OCT-1994 01-NOV-1997 DMC1\_LILLO P37384;

(Rel. (Rel. (Rel.

30,

update)

update)

Created) Last sequence up

STANDARD;

PRT;

349

₽

```
RESULT
R518_MC
ID R5
AC O3
DT 11
DT 12
DT 12
OT 3
DT 3
DT 3
OT 3
OT 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SQ TWO BEAUTH OF THE STREET OF THE SQ OF TWO BEAUTH OF TWO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                      õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                 15-DEC-1998 (Rel. 37, Created)
15-DEC-1998 (Rel. 37, Last sequence up
30-MAY-2000 (Rel. 39, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             microsporocytes."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tabata S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Vir
Magnoliophyta;
                                                                                                                                                                                                     R51B_MOUSE
035719;
                                                                                                                                                                                                                                                            MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Meiosis; Cell cycle; ATP-binding; Nuclear protein.
NP_BIND 138 145 ATP (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNA Res.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Kobayashi T., Kobayashi E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=96051386; PubMed=7584025;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TISSUE=Flower buds;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=4690;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Lilium longiflorum (Trumpet lily)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEIOTIC RECOMBINATION PROTEIN DMC1 HOMOLOG
                                                          RAD51L1 OR RAD51B OR REC2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Characterization of cDNAs induced in meiotic prophase in lily
                                                                                                                                                                                                                                                                                                                                                                          312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     135
                                                                                                                                                                                                                                                                                                                                                                                                                              249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15 YVSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLA 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SIMILARITY: STRONG TO OTHER EUKARYOTIC RECA-LIKE PROTEIN; PROKARYOTIC RECA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Res. 1:15-26(1994).
FUNCTION: MAY PARTICIPATE IN MEIOTIC RECOMBINATION
                             musculus (Mouse)
                                                                                         REPAIR PROTEIN RAD51 HOMOLOG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YITGS----DVLLKRKSVIRITTGSQALDELLGGGIETLQITEAFGEFRSGKTQIAHTLC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JC2214; JC2214
                                                                                                                                                                                                                                                                                                                                                                          LRKGKGEQRVCKIFDAPNLPESEAVFQITPGGVADA 347
                                                                                                                                                                                                                                                                                                                                                                                                                            LH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRDA 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VSTQLPVSMHGGNGKVAYIDTEGTFRPDRIVPIAERFGMD------ASAV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQ 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RQQKLAQMLSRLTKIAEEFNVAVYMTNQVIADPGGGMFISDPKKPAGGHVLAHAATVRLM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSF---QLTLALGDSWSHSCTNRLI 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----LDNIIYARAYTYEHQYNLLLALAAKMSE-EPFRLLIVDSVIALFRVDFSGRGELAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  D21821; BAA04845.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PS50162; RECA_2; 1. PS50163; RECA_3; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Viridiplantae;
  Metazoa;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      349 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Liliopsida; Liliales; Liliaceae;
                                                                                                                                                                                                                                     STANDARD;
        Chordata; Craniata;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      38272 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Embryophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sato S., Hotta Y., Miyajima N., Tanaka
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 313; pp 1
                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CDA444A1166DBEC6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                    update)
                                                                                                                                                                                                                                     350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Tracheophyta; Spermatophyta;
iliaceae; Lilium.
              Vertebrata; Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 1;
                                                                                                                                                                                                                                     ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   104;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 349;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOME,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7;
```

```
γΩ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                    RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                   Q96449;
15-JUL-1998 (Rel. 3
15-JUL-1998 (Rel. 3
15-JUL-1998 (Rel. 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; U92068; AADVILLE (192068; MGI:1099436; Rad5111.

MGD; MGI:1099436; Rad5111.

PROSITE; PS50162; RECA_2; 1.

DNA-binding; ATP-binding; Nuclear protein.

DNA-binding; ATP-binding; ATP (POTENTIAL).

108 115 ATP (POTENTIAL).

28137 MW; A57F547CA9CE6D65 CRC64;
                                                                                                                                                                                                                                                                                             SOYBN
DMC1_S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids I;
                                                                                                                                                           15-JUL-1998 (Rel. 36, Last sequence update) 15-JUL-1998 (Rel. 36, Last annotation updat MEIOTIC RECOMBINATION PROTEIN DMC1 HOMOLOG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Entry of the Swiss Institute of Bioinformatics and the Bioinformatics and t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=97352813; PubM
Rice M.C., Smith S.T.,
NCBI_TaxID=3847;
[1]
                                                    Magnoliophyta; eudicotyledons; core Fabales; Fabaceae; Papilionoideae;
                                                                                                                                  Glycine max (Soybean)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=10090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   125 ATLPTSLGGLEGAVVYIDTESAFTAERLVEIAE-----SRFPQYFNTEEKLLLTSSRV 177
                                                                                                                                                                                                                                                                                                                                                                                                                                  341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20 QNAWDM---FSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAIN 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PROKARYOTIC RECA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GIRDAVSSNHKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SLSEGTSGSSCLVAALGNTWGHCVNTRLILQYLDSERRQILIAKSPLAAFTSFVYTIKGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q--KQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP---HSHEK----SSSV 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QTAYELKTRRSAHLSPAFLSTTLCALDEALHGGVPCGSLTEITGPPGCGKTQFCIMMSVL 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HLCRELTCEGLLQ-----RLESLEEEII------SKGVKLVIVDSIASVVRKEFD
                                                                                                                                                                                                                                                                                                                                                                                                                                  GL---VLQGHER
                                                                                                                                                                                                                                                                                                  SOYBN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PKLQGNIKERNKFLGKGASL-LKYLAGEFSIPVILTNQITTHLSGALPSQADLVSPADDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----DLALRTRVL-SGLSLKLMKIAKTYNLAVVLLNQVTTKF---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          --TEGSFQLTLALGDSWSHSCTNRLILHWNGNERYAHL-DKSPSLPVASAPYAVTGK 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PubMed=9207106;
                                                                                                                                                                                                                                           36, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                    349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pred. No. 1e-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 313;
                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                          Glycine
                                                                                                                                                                ion update)
                                                                                                                                                                                                                                                                                                  345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         homology to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PROTEIN;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  maydis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ţ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REC2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        a collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOME,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               б
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        13;
```

```
RESULT 12
RADA_METJA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SO THE REPORT OF THE THE REPORT OF THE REPORT OF THE REPORT OF THE REPORT OF THE REPOR
  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 90
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q49593; Q58279;
01-NOV-1997 (Rel. 3
01-NOV-1997 (Rel. 3
15-DEC-1998 (Rel. 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                             SEQUENCE FROM N.A.

MEDILINE=96.51095; PubMed=8668545;

Sandler S.J., Satin L.H., Samra H.S., Clark A.J.;

Sancharike genes from three archaean species with putative products similar to Rad51 and Dmcl proteins of the yeast Saccharomyces cerevisiae.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; U66836; AAB07025.1; -. HSSP; P03017; 2REB. PCOSITE; PS50162; RECA_2; 1. PROSITE; PS50163; RECA_3; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the El the European Bioinformatics Institute. There are no resti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hadi M.Z., Finer J.J.;
Submitted (AUG-1996) to the EMBL/GenBank/DDBJ databases.
-i- FUNCTION: MAY PARTICIPATE IN MEIOTIC RECOMBINATION.
-i- SUBCELLULAR LOCATION: NUCLEAR (POTENTIAL).
SEQUENCE
                                                     Saccharomyces
Nucleic Acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Meiosis; Cell cycle; ATP-binding; Nuclear protein.
NP_BIND 134 141 ATP (POTENTIAL).
                                                                                                                                                                                                                                                                                                                 Methanococcus
                                                                                                                                                                                                                                                                                                                                         Archaea; Euryarchaeota;
                                                                                                                                                                                                                                                                                                                                                                 Methanococcus jannaschii
                                                                                                                                                                                                                                                                                                                                                                                              RADA OR MJ0869
                                                                                                                                                                                                                                                                                                                                                                                                                            DNA REPAIR PROTEIN RADA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RADA_METJA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                              NCBI_TaxID=2190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SIMILARITY: STRONG TO OTHER EUKARYOTIC RECA-LIKE PROTEIN; SOME, PROKARYOTIC RECA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FRKGKGEQRICKVFDAPNLPEAEAVFQITAGGIADA 343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YVSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLA 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VSTQLPTNMRGGNGKVAYIDTEGTFRPDRIVPIAE-------RFGMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQ 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YITGS----DALLKRKSVIRITTGSQALDELLGGGVETSAITEAFGEFRSGKTQLAHTLC 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RQQKLAQMLSRLIKIAEEFNVAVYMTNQVISDPGGGVFVTDPKKPAGGHVLAHAATVRLM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSF---QLTLALGDSWSHSCTNRLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PGAVLDNIIYARAYTYEHQYNLLLGLAAKMSE-EPFRLLIVDSVIALFRVDFSGRGELAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE----DLAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     90;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          35,
37,
                                                        24:2125-2132(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             37475 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Created)
                                                                                                                                                                                                                                                                                                                                         Methanococcales; Methanococcaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 312; DB 1;
Pred. No. 1.2e-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                685CB696F923BAB6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches 108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 345;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels 32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             a collaboration
                                                                                                                                        protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6
```

```
RESULT
DLH1_CAN
ID DLH
AC P5C
DT 01-
DT 01-
DT 01-
DT 01-
DT 01-
CO MEI
GN DLH
GN DLH
OC Sac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SO TENER CONTRACTOR CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 92
                                                                                                                         1_CANAL STANDARI
DLH1_CANAL STANDARI
P50265;
01-OCT-1996 (Rel. 34, C
01-OCT-1997 (Rel. 35, I
01-NOV-1997 (Rel. 35, I
MEIOTIC RECOMBINATION F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bult C.J., White O., Olsen G.J., Zhou L., Fleischmann R.D., Sutton G.G., Blake J.A., Fitzgerald L.M., Clayton R.A., Gocayne J.D., Kerlavage A.R., Dougherty B.A., Tomb J.-F., Adams M.D., Reich C.I., Overbeek R., Kirkness E.F., Weinstock K.G., Merrick J.M., Glodek A., Scott J.L., Geoghagen N.S.M., Weidman J.F., Fuhrmann J.L., Nguyen D., Utterback T.R., Kelley J.M., Peterson J.D., Sadow P.W., Hanna M.C., Cotton M.D., Roberts K.M., Hurst M.A., Kaine B.P., Borodovsky M., Klenk H.-P., Fraser C.M., Smith H.O., Woese C.R., Venter J.C.; "Complete genome sequence of the methanogenic archaeon, Methanococcus jannaschii.";
                                                                                                  DLH1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Science 273:1058-1073(1996).

-!- FUNCTION: PROBABLY INVOLVED IN DNA REPAIR AND IN HOMOLOGOUS RECOMBINATION AND REQUIRED FOR MEIOTIC RECOMBINATION.
-!- SIMILARITY: STRONG TO EUKARYOTIC RECA-LIKE PROTEIN; SOME, TO PROKARYOTIC RECA PROTEIN.
      Eukaryota; Fungi;
Saccharomycetales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; U45312;
EMBL; U67531;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=JAL-1 / DSM 2661 / ATCC 43067;
MEDLINE=96337999; PubMed=8688087;
                                                              Candida albicans (Yeast).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNA damage; DNA recombination; ATP-binding; DNA-binding, NP_BIND 136 143 ATP (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TIGR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   137
                                                                                                                                                                                                                                                                                                                                                                                                                                                  297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MGDQSGSRNGPQQKYYSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGG
                                                                                                                                                                                                                                                                                                                                                                                                                                               GSFQLTLALGDSWSHSCTNRLILH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MFGSGKTQIAHQACVNLQCPERIVADDAIKDEILNEPKAVYIDTEGTFRPERIVQMAEAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VPGVGKTQLGIQLAINVQIPVECGGLGG------KAVYIDTEGSFMVERVYQIAEGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LGFKSGT-----EVLSQRKNIW------KLSTGSKNLDEILGGGLESQSVTEFAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LVIVDSLTSTFRTEYIGRGKLAERQQKLGRHMATLNKLADIYNCVVIVTNQVAARPDALF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IVIIDSVTFHFRQDF----EDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTK--FTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVR 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     мJ0869;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PS50162; RECA_2; 1.
PS50163; RECA_3; 1.
                                    Fungi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           352 AA; 39084 MW; 861579C0C59AA29C CRC64;
                                                                                                                             (Rel. 34, Created)
(Rel. 34, Last sequence update)
(Rel. 35, Last annotation updat)
OMBINATION PROTEIN DLH1 (DMC1 HC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -----GLDGNEVLNNIFVARAYNSDMQMLYAENVENLIREGHNIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAC44122.1; -.
AAB98875.1; -.
                                                                                                                                                                                                                                                                                           STANDARD;
Ascomycota; mitosporic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20.4%; Score 312; DB 1; 31.0%; Pred. No. 1.3e-19; Live 47; Mismatches 106
   Saccharomycotina; Saccharomycetes; Saccharomycetales; Candida.
                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                ion update)
(DMC1 HOMOLOG).
                                                                                                                                                                                                                                                                                           324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        here are no restrictions as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 352;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
```

```
SO PER MARKANA CONTRACTOR CONTRAC
                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 14
RA51_USTMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                               01-NOV-1997
01-NOV-1997
15-JUL-1998
                                                                                                                                                                                                                                                                                                                                                            RA51_USTMA
Q99133;
                                                                                                                                            Ustilago maydis (Smut fungus).
Eukaryota; Fungi; Basidiomycota; Ust
Ustilaginomycetidae; Ustilaginales;
MEDLINE=97225207; PubMed=9071580; Ferguson D.O., Rice M.C., Rendi Nelloman W.K.;
                                                                                                                                                                                                                                                         DNA REPAIR PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROSITE; PS50162; RE(PROSITE; PS50163; RE(PROSITE; PS50163; RE(PROSITE) PS50163; Cell cycle; NP_BIND 112 1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              use by non-profit institutions as long modified and this statement is not removed. entitles requires a license agreement (See
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meiosis-specific gene DMC1.";
Genetics 143:769-776(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=96363911; PubMed=8725225; Diener A.C., Fink G.R.;
                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                    RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              <del>-</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=5476;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ω
4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            s SWISS-PROT entry is copyright. It is produced through ween the Swiss Institute of Bioinformatics and the Ew European Bloinformatics Institute. There are no restr by non-profit institutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FUNCTION: REQUIRED FOR MEIOTIC RECOMBINATION, SYNAPTONEMAL COMPLEX FORMATION AND CELL CYCLE PROGRESSION (BY SIMILARITY). SUBCELLULAR LOCATION: NUCLEAR (POTENTIAL). SIMILARITY: STRONG TO OTHER EUKARYOTIC RECA-LIKE PROTEIN; SOME, TO PROKARYOTIC RECA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QDSPNMPEKECVYVIGEGGIKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYI 93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DKSPSLPVASAPYAVTGKGIRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DYNIAVFLTNQVQS--DPGASALFAAADGRKPVGGHVLAHASATRILLRKGRGEERVAKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TYNLAVVLLNQVTTKFTEGSFQLTLAL-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HITTGSKQFDEILGGGIQSMSITEVFGEFRCGKTQLCHTLCVAAQLPTDMGGGEGRVAYI 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HQIELVEQLGNELAE-GTFRLLIVDSIMACFRVDYSGRGELNERQQKLNQHLSNLTRVAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE----DLALRTRVLSGLSLKLMKIAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DTEGTFRPDRIRSIAERYGVDADIC----------------LENISYARALNSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DTEGSFMVERVYQIAE--GCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYT 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   is a functional Candida albicans homologue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       U39808; AAC49400.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PS50162; RECA_2; 1. PS50163; RECA_3; 1.
                                                                                                                                                                                                                                                                               7 (Rel. 35,
7 (Rel. 35,
8 (Rel. 36,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            324 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                                                                         RAD51.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            35281 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19.9%;
33.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                            Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATP-binding; Nuclear protein
19 ATP (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                 Created)
                  Rendi M.H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 304;
Pred. No. 5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            95CD769514D9CF82 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                       Ustilaginomycetes;
                                                                                                                                                  Ustilaginaceae;
                                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                                      339
                     Kotani H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -GDSWSHSCTNRLILH-WNGNERYAHL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 1;
.5e-19;
                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 324;
                          Kmiec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                  Ustilago.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      restrictions
                       Е.В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         and for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7;
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SQ THE DRAW OF THE RESTRICT OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                        NP_BIND
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                    01-OCT-2000 (Rel. 40, Last sequence update) 01-OCT-2000 (Rel. 40, Last annotation updat MEIOTIC RECOMBINATION PROTEIN DMC1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROSITE: PS50163; RECA_2; 1.

PROSITE: PS50163; RECA_3; 1.

DNA damage; DNA repair; ATP-binding; DNA recombination.

NP_BIND 127 134 ATP (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Interaction between Ustilago maydis REC2 and RAD51 genes repair and mitotic recombination.";

Genetics 145:243-251(1997).
-i- FUNCTION: REQUIRED BOTH FOR RECOMBINATION AND FOR THE DNA DAMAGE CAUSED BY X-RAYS (BY SIMILARITY).
-i- SIMILARITY: STRONG TO OTHER EUKARYOTIC RECA-LIKE PROTE
                      recombination.";
                                                Tanaka S., Nojima H.;
"Dmcl of Schizosaccharomyces pombe plays
                                                                                                            Fukushima K., Tanaka
                                                                                                                                  SEQUENCE FROM N.A., AND FUNCTION. MEDLINE=20368631; PubMed=10908327;
                                                                                                                                                                                                                                               Schizosaccharomycetales; Schizosaccharomyces.
                                                                                                                                                                                                                                                                                               Eukaryota; Fungi; Ascomycota; Schizosaccharomycetes;
                                                                                                                                                                                                                                                                                                                              Schizosaccharomyces pombe (Fission yeast)
                                                                                                                                                                                                                                                                                                                                                              DMC1 OR DMP1 OR SPAC8E11.03C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SCHPO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       InterPro; IPR000445; -. Pfam; PF00633; HHH; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; U62484; AAC61878.1; -.
                                                                                                                                                                                                                     NCBI_TaxID=4896;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROKARYOTIC RECA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LPEADAVFAIGPEGIIDPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LPVASAPYAVTGKGIRDAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VAVVITNQVVAQ-VDGATAFTADAKKPIGGNIVAHASTTRLSLRKGRGNQRICRIADSPC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LAVVLLNQVTTKFTEGSFQLTLAL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QLLMQASAMMAESR-FSLLIVDSLTSLYRTDFSGRGELSARQMHLAKFLRGLMRLADEFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AVINYMEKFLREHKDVRIVIIDSVTFHFRODFE----DLALRTRVLSGLSLKLMKIAKTYN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TENTFRPTRLLAVAE - - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQI 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ITTGSKNLDAILGGGMETGSITELYGEFRTGKSQLCHTLAVTCQLPVDMGGGEGKCLYID 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    84;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       339 AA;
                                                                                                                                                                                                                                                                                                                                                                                                              (Rel. 37, Created)
(Rel. 40, Last sequence (Rel. 40, Last anno
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
28:2709-2716(2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       36396 MW;
                                                                                                         Y., Nabeshima
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19.6%;
                                                                                                                                                                                                                                                                           Schizosaccharomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 299.5;
Pred. No. 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       D0E3676272FB0254 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -----RFGLNGEEVLDNVAYARAYNADHQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -GDSWSHSCTNRLILH-WNGNERYAHLDKSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             332
                                                                                                                                                                                                                                                                                                                                                                                                           update)
                                                                                                      Yoneki T., Tougan T.
                                                      ಭ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .4e-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RECA-LIKE PROTEIN;
                                                        in meiotic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPAIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOME,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TO
```

```
Qy
                                                                       В
                                                                                                         Qy
                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                   밁
                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Meiosis; Cell cycle; ATP-binding; Nuclear protein.

MP_BIND

120

127

ATP (POTENTIAL).

CONFLICT

25

25

CONFLICT

237

237

SEQUENCE

332 AA; 36408 MW; 86B73EAA491F7B02 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; AB008545; BAA28671.1; ...
EMBL; D64035; BAA23984.1; ...
EMBL; AL021817; CAA17024.1; ...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -!- SUBCELLULAR LOCATION: NUCLEAR.
-!- SIMILARITY: STRONG TO OTHER EUKARYOTIC RECA-LIKE PROTEIN; SOME, TO PROKARYOTIC RECA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              McLean J., Harris D., Wood V., Barrell B.G., Rajandream M.A.; Submitted (FEB-1998) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: REQUIRED FOR MEIOTIC RECOMBINATION AND CELL CYCLE PROGRESSION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Yamazaki A.; Submitted (SEP-1995) to the EMBL/GenBank/DDBJ databases. [3]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PROSITE; PS50162; RECA_2; 1. PROSITE; PS50163; RECA_3; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       [2]
SEQUENCE FROM N.A.
                                                                                                                                                                                         144
                                                                                                                                                                                                                           144 GGAEGKVAFIDTEGTFRPDRIKAIAE-----
                                                                         244
                                                                                                                                               184 VSRAYNSEQQMEYITKLGTIFAEDGQYRLLIVDSIMALFRVDYSGRGELSERQQKLNIML
                                                                                                         201 LKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDS-----WSHSCTNRLILH-WN 252
                                                                                                                                                                                                                                                                84
                                                                                                                                                                                                                                                                                                  84 EISQNRKKVWSISTGSEALNGILGGGIQSMSITEVFGEFRCGKTQMSHTLCVTAQLPRDM 143
                                                                                                                                                                                                                                                                                                                                          29
GEERVAKLNDSPDMPEAECSYVITPGGIAD 330
                                                                                                                                                                                                                                                                                                                                    ELSQKH-----ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVEC 83
                                 GNERYAHLDKSPSLPVASAPYAVTGKGIRD 282
                                                                       ARLNHISEEFNVAVFVTNQVQ----ADPGAAMMFASNDRKPVGGHVMAHASATRLLLRKGR 300
                                                                                                                                                                                 YFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLS 200
                                                                                                                                                                                                                                                   GGLGGKAYYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIY 143
                                                                                                                                                                                                                                                                                                                                                                                l Similarity
82; Conserv
                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                            19.4%; Score 297.5; DB 1; Length 332; 30.4%; Pred. No. 2.1e-18; tive 46; Mismatches 103; Indels 39
                                                                                                                                                                                                                           -RFGVDADQAMENII 183
                                                                                                                                                                                                                                                                                                                                                                              39;
                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                            6.
```

Search completed: October 1, 2001, 16:29:24 Job time: 117 sec

•				
	,			

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Total number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ö
Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                      417
387.5
354.5
352.5
345
314.5
313
313
313
313
313
313
312
312
309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     <u>*</u> 3 2 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query
274.6
274.6
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
275.3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         October 1, 2001, 16:27:27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PIR_68:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-537-654-2
1530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 219241 seqs, 76174552 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MGDQSGSRNGPQQKYVSGAQ.....VTGKGIRDAVSSNHKRARVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       pir2:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    pir1:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
DВ
                                                                                 571766

571766

571767

5769374

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

6769051

676905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                F84888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Search time 15.99 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (without alignments)
1400.583 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNA repair protein meiosis-specific r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                rad51 protein, sho
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA repair protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      hypothetical 38.3K Reca/Rad51/DMC1-li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meiosis-specific
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           meiosis-specific r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNA repair protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA repair protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       probable radA prot
radA protein - Sul
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             probable RAD51C-li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Description
```

## ALIGNMENTS

A;Title: Sequence and analysis of chromosome 2 of the plant Arabidopsis thaliana. A;Reference number: A84420; MUID:20083487
A;Accession: F84888

GB:AE002093; NID:g2583126; PIDN:AAB82635.1; GSPDB:GN00139

A;Status: preliminary A;Molecule type: DNA A;Residues: 1-332 <STO>

C; Genetics: A; Cross-references: R;Lin, X.; Kaul, S.; Rounsley, S.D.; Shea, T.P.; Benito, M.I.; Town, C.D.; Fujii, C.Y M.; Koo, H.; Moffat, K.S.; Cronin, L.A.; Shen, M.; Vanaken, S.E.; Umayam, L.; Tallon, euss, D.; Nierman, W.C.; White, O.; Eisen, J.A.; Salzberg, S.L.; Fraser, C.M.; Venter Nature 402, 761-768, 1999

probable RAD51C-like DNA repair protein [imported] - Arabidopsis thaliana C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 02-Feb-2001 #sequence\_revision 02-Feb-2001 #text\_change 02-Feb-2001

C; Accession: F84888

probable radA protein APE0119 - Aeropyrum pernix (strain K1)
C;Species: Aeropyrum pernix
C;Date: 20-Aug-1999 #sequence\_revision 20-Aug-1999 #text\_change 20-Jun-2000 Qy Qy Ъ δÃ 밁 A; Gene: At2g45280 A; Map position: 2 g 밁 Qy Matches Query Match Best Local Similarity 139 LADIYYERICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFEDLALRTRVLSG 198 119 298 259 HLDKSPSLPVASAPYAVTGKGIRDAVSSNHKRARV 293 238 MALKFMKLAKKFSLAVVLLNQVTTKFSEGSFQLALALGDSWSHSCTNRVILYWNGDERYA 199 LSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDSWSHSCTNRLILHWNGNERYA 258 79 IPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERF 138 59 AKNAWDMLHEEESLPRITTSCSDLDNILGGGISCRDVTEIGGVPGIGKTQIGIQLSVNVQ 118 19 AQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQ 78 YIDKSPSLPSASASYTVTSRGLRNS-SSSSKRVKM IPRECGGLGGKAIYIDTEGSFMVERALQIAEACVEDMEEYTGYMHKHFQANQVQMKPEDI 178 183; Conservative 64.6%; Score 988; DB 2; Length 332; 66.5%; Pred. No. 2.9e-77; tive 51; Mismatches 39; Indels 331 2 Gaps 297 2

298.5 297.5 293.5 29.5 287.5 287.5 281.5 281.5 280.5 277.5 277.5 265.5

RAD51 protein | RAD51 protein | RAD51 protein | Rad51 homolog |

recombination/repa RAD51 protein - ye RAD51 protein homo RAD51 protein homo DNA repair protein DMC1/LIM15 homolog meiotic recombinat meiotic recombinat DMC1/LIM15 homolog hypothetical prote

radA protein -

Hal

```
A; Gene:
C; Superf
                 뫄
                                                     δÃ
                                                                                                     В
                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                      A;Cross-references:
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 R;Sandler, S.J.; Satin, L.H.; Samra, H
Nucleic Acids Res. 24, 2125-2132, 1996
A;Title: recA-like genes from three ar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                radA protein - Sulfolobus solfataricus
C;Species: Sulfolobus solfataricus
C;Date: 14-Feb-1997 #sequence_revision 13-Mar-1997 #text_change
C;Accession: S71093
                                                                                                                                                                                                                                                                                                                                                                                A; Molecule type: DNA
A; Residues: 1-324 <SAN>
                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Reference number: S71093; MUID: 96251095
A; Accession: S71093
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                       A; Status: preliminary; nucleic acid sequence not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S71093
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Gene: APE0119
C;Superfamily: yeast DNA repair protein RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C;Accession: D72766
R;Kawarabayasi, Y.; Hino, Y.; Horikawa, H.; Yamazaki, S.; Haikawa, Y.; Jin-no, K.; Taka awa, H.; Takamiya, M.; Masuda, S.; Funahashi, T.; Tanaka, T.; Kudoh, Y.; Yamazaki, J.; DNA Res. 6, 83-101, 199
B;Title: Complete genome sequence of an aerobic hyper-thermophilic Crenarchaeon, Aeropy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Experimental source: strain K1 C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Molecule type: DNA
A; Residues: 1-319 <KAW>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Cross-references: DDBJ:AP000058; NID:g5103388; PIDN:BAA79030.1; PID:g5103509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Reference number: A72450; MUID:99310339 A; Accession: D72766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 102
                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                           Superfamily: yeast DNA repair protein RAD51
                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Status: preliminary
                 119
                                               65 GKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHE 124
                                                                                                                                           13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241 HSCTNRLILHWN-GNERYAHLDKSPSLPVASAPYAVTGKGIRD 282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         116
                                                                                                     59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13
                                                                                                                                                                                                                                                                                                                      radA
                                                                                                                                      QKYVSGAQNAWD------MFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGV 64
           GKTQLCHQLSVNVQLPPEKGGLSGKAVYIDTEGTFRWERIENMAKALGLDI
                                                                                              QKIIKEARDALDIRFKTALEVKKERMNVKKISTGSQALDGLLAGGIETRTMTEFFGEFGS 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HAPGVRVYLKKSRGNKRIARVVDAPHLPEGETVFAITEWGIRD 317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----GLDPDEVMKNIYWIRAINSHHQIAIVDKLFTMVK-NDNIKLVVVDSVTSHFRA 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQ 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKTQICHQLSVNVQLPEDKGGLEGKAVYVDTEGTFRWERIEQMARGV-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHE 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QKYVSGA-----QNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGV 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EFPGRENLAMRQQLLNRHLHQLMRLADIFNVAVVITNQVMARPDVFYGDPTQAVGGHVLG 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DF - - - EDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDS-WS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                102;
                                                                                                                                                                                      97;
                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                        EMBL: U45310; NID: g1378035;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 from three archaean species with putative
                                                                                                                                                                                                        25.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               27.3%;
                                                                                                                                                                                      61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61;
                                                                                                                                                                                                     Score 387.5; DB 2; Pred. No. 1e-25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 417; DB 2
Pred. No. 3e-28;
                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                H.S.; Clark, A.J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 2; Length 319;
                                                                                                                                                                                                                                                                                                                                                     PIDN:AAC44123.1; PID:g1378036
                                                                                                                                                                                   93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                86;
                                                                                                                                                                                 Indels
                                                                                                                                                                                                                          Length 324;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                 33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       29-Sep-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein products sim
                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
           169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Takal
R;Smith, D.R.; Doucette-Stamm, L.A.; Deloughery, C.; Lee, H.; Dubois, J.; Aldredge, T.; Qiu, D.; Spadafora, R.; Vicaire, R.; Wang, Y.; Wierzbowski, J.; Gibson, R.; Jiwani, ki, S.; Church, G.M.; Daniels, C.J.; Mao, J.; Rice, P.; Noelling, J.; Reeve, J.N. J. Bacteriol. 179, 7135-7155, 1997
A;Title: Complete genome sequence of Methanobacterium thermoautotrophicum Delta H: fu A;Reference number: A69000; MUID:98037514
                                                                                                                                C;Species: Methanobacterium thermoautotrophicum
C;Date: 05-Dec-1997 #sequence_revision 05-Dec-1997 #text_change 29-Sep-1999
C;Accession: A69051
                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                    2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                            DNA repair protein RadA - Methanobacterium thermoautotrophicum (strain Delta
                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                          A69051
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
```

u

```
Smith, H.O.; Woese, C.R.; Venter, J.C.
A;Title: The complete genome sequence of the hyperthermophilic, sulfate-reducing arch A;Reference number: A69250; MUID:98049343
A;Accession: A69374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Cross-references: GB:AE001035; GB:AE000782; NID:g2689358; PIDN:AAB90248.1; C;Superfamily: yeast DNA repair protein RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Status: preliminary; nucleic acid sequence not shown; translation not shown A;Molecule type: DNA A;Residues: 1-337 <KLE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R;Klenk, H.P.; Clayton, R.A.; Tomb, J.F.; White, O.; Nelson, K.E.; Ketchum, K.A.; Dod.; Fleischmann, R.D.; Quackenbush, J.; Lee, N.H.; Sutton, G.G.; Gill, S.; Kirkness, E. Glodek, A.; Zhou, L.; Overbeek, R.; Gocayne, J.D.; Weidman, J.F.; McDonald, L. Nature 390, 364-370, 1997

A;Authors: Utterback, T.; Cotton, M.D.; Spriggs, T.; Artiach, P.; Kaine, B.P.; Sykes,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA repair protein RAD51 (radA) homolog - Archaeoglobus fulgidus
C;Species: Archaeoglobus fulgidus
C;Date: 05-Dec-1997 #sequence_revision 05-Dec-1997 #text_change 29-Sep-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C; Accession: A69374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
      284
                                                                                                                                                                           189
                                                                                                                                                                                                                                                                                          136
                                                                                                                     231
                                                                                                                                                                                                                                    171
                                                                                                                                                                                                                                                                                                                                                131 NVQLPEDEGGLEGSVIIIDTENTFRPERIIQMAEA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
                                                                                                                                                                                                                                                                                                                                                                                                          76
                                                                                                                                                                                                                                                                                                                                                                                                                                                          71 IGGFESGDKVLERRRSVKKITTGSKDLDELLGGGVETQAITEFFGEFGSGKTQICHQLAV 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   16 VSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAI 75
                                                      HSCTNRLILHWNGNE-RYAHLDKSPSLPVASAPYAVTGKGIRDAVSSNHKRAR 292
                                                                                                                                                                                                                              NEVLKNIYVAQAYNSNHQMLLVDNAKELAEKLKKEGRPVRLIIVDSLMSHFRAEYVGRGT 230
                                                                                                                                                                                                                                                                                 ERFLADIYYFRICSYTEQIAVIN----YMEKFLREHKDVRIVIIDSVTFHFRODF---ED 188
HTATFRIYLKKGKDDLRIARLIDSPHLPEGEAIFRVTERGIEDAEEKDKKKRK
                                                                                                               LADRQQKLNRHLHDLMKFGELYNAAIVVTNQVMAR-----PDVLFGDPTKPVGGHIVA
                                                                                                                                                                     LALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDSW------S 240
                                                                                                                                                                                                                                                                                                                                                                                                 NVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQP 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HVPGIRIQLKKSRGNRRIARVVDAPHLPEGEVVFALTEEGIRDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HSCTNRLILHWN-GNERYAHLDKSPSLPVASAPYAVTGKGIRDA 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DF---EDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLAL-GDSWS 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQ 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EYPGREILAVRQQKLNKHLHQLTRLAEVYDIAVIITNQVMARPDMFYGDPTVAVGGHTLY 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ------DNVMNNIYYIRAINTDHQIAIVDDLQELVSKDPSIKLIVVDSVTSHFRA 218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23.2%; Score 354.5; DB 2 32.4%; Pred. No. 7.5e-23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 337;
                                                                                                                                                                                                                                                                                                                                             ·--KGLDG 170
336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            43;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PID:g264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6;
```

```
A;Accession: A69051
A;Status: preliminary; nucleic acid sequence not shown; translation not shown A;Molecule type: DNA
A;Residues: 1-311 <MTH>
A;Cross-references: GB:AE000901; GB:AE000666; NID:g2622486; PIDN:AAB85860.1; FA:Experimental source: strain Delta H C;Genetics:
A;Gene: MTH1383
C;Superfamily: yeast DNA repair protein RAD51
                밁
                                                    Ş
                                                                                            밁
                                                                                                                                δÃ.
                                                                                                                                                                          Вþ
                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                         A;Gene: radA; PABULD4
C;Superfamily: yeast DNA repair protein RAD51
                                                                                                                                                                                                                                                                                                                                                                                                  A; Experimental source: strain Orsay C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNA repair protein rad51 (rada) PAB0164 - Pyrococcus abyssi (strain Orsay) C;Species: Pyrococcus abyssi C;Date: 20-Aug-1999 #sequence_revision 20-Aug-1999 #text_change 20-Jun-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Molecule type: DNA
A; Residues: 1-356 <KAW>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Description: Pyrococcus abyssi genome sequence: A; Reference number: A75001
A; Accession: F75214
                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Cross-references: GB:AJ248283; GB:AL096836; NID:g5457433; PIDN:CAB49165.1; PID:g54576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  submitted to the EMBL Data Library, July 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C; Accession:
                                                                                                                                                                                                                                                       Query Match
Best Local S
Matches 97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       122
                                                        116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   266 VLGHAATYRIWLKKGLAGKRIARLVDSPHLPEGECVFKITTAGIVD 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            106
                                                                                              141 TEVFGEFGSGKTQLAHTLAVMVQLPPEEGGLNGSVIWIDTENTFRPERIREIAK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        46
                                                                                                                                    56
                                                                                                                                                                            81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  10 GPQQKYVSGA------QNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGV 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           σ
                                                    LEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLRE----HKDVR 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FRAEYVGREALATRQQKLNQHLHTLQNIANTYNAAVFVTNQVQARPDAFFGSPTKAIGGH 265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FRQDF---EDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDS 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFH 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FGSGKSQLSHELAVTVQLPEERGGLDAEAVFIDTENTFRPERIEQIANAF------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GVAEKVIEAARRAEKIDFETAFDVMERRKDVGRITTGSKALDELIGGGIETQAITEVFGE 105
                                                                                                                                                                            AGISEGAALKIIQAARKAANLGTFMRADEYLKKRESIGRISTGSKSLDKLLGGGIETQAI 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -WSHSCTNRLILHWN-GNERYAHLDKSPSLPVASAPYAVTGKGIRD 282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PGVGKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPH 121
                                                                                                                                                                                                               SGSRNGPQQKYVSGAQNAWD----MFSDELSQK-----HITTGSGDLNDILGGGIHCKEV 55
                                                                                                                                  TEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDI 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          96;
                                                                                                                                                                                                                                                         Similarity
97; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ELDLEEVLNKIHIARAFNSSHQILMAEKVNELIQEGKNIRLVIVDSLTAH 205
                -NRGLDPDEVLKHIYVARAFNSNHQMLLVQQAEDKIKELLNTDKPVK 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23.0%;
                                                                                                                                                                                                                                                                            22.5%;
                                                                                                                                                                                                                                                         51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 352.5; DB 2;
Pred. No. 1e-22;
""sematches 111;
                                                                                                                                                                                                                                                                            Score 345; DB 2;
Pred. No. 5.3e-22;
                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                           107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             insights
                                                                                                                                                                                                                                                                                                 Length 356;
                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               into archaeal chromosome str
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PIDN:AAB85860.1; PID:g26224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          33;
                                                                                                                                                                                                                                                           44;
                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 155
                                                                                                194
                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          <u>ن</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                 δÃ
                                                                             В
                                                                                                               ρ
                                                                                                                                                           밁
                                                                                                                                                                                               Ω
dd
```

```
A; Map position:
A; Introns: 44/3
C; Function:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 submitted to the EMBL Data Library, December 1994 A; Description: The sequence of S. cerevisiae cosmids A; Reference number: S50682
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Molecule type: DNA
A;Residues: 1-334 <KOB>
A;Residues: 1-334 <KOB>
A;Cross-references: EMBL:Dl0865; NID:g287607; PIDN:BAA01637.1; PID:g287608
A;Cross-references: EMBL:Dl0865; NID:g287607; PIDN:BAA01637.1; PID:g287608
A;Mulligan, J.T.; Dietrich, F.S.; Hennessey, K.M.; Sehl, P.; Komp, C.; Wei.
submitted to the EMBL Data Library, February 1993
A;Reference number: S30812
A;Accession: S30857
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cell 69, 439-456, 1992
A;Title: DMC1: a meiosis-specific yeast homolog
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C;Species: Saccharomyces cerevisiae
C;Date: 30-Sep-1993 #sequence_revision 30-Sep-1993
C;Accession: A38214, S30276, S30857; S50682
R;Bishop, D.K.; Park, D.; Xu, L.; Kleckner, N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   meiosis-specific recombination protein DMC1 [validated] - yeast (Saccharomyces N;Alternate names: protein YER179w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Description: DMC1 is involved in reciprocal recombination during meiosis C; Superfamily: yeast DNA repair protein RAD51 C; Keywords: purine nucleotide binding .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Molecule type: DNA
A;Residues: 1-334 <MUL>
A;Cross-references: GB:U18922; EMBL:L11229; NID:g603405; PIDN:AAB64706.1; PID:g603420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Title: Isolation and characterization of a yeast gene A;Reference number: S30275; MUID:93204898 A;Accession: S30276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Cross-references: GB:M87549; NID:g171400; R;Kobayashi, T.; Hotta, Y.; Tabata, S. Mol. Gen. Genet. 237, 225-232, 1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Reference number: A38214; MUID:92257586
A; Accession: A38214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Molecule type: DNA
A; Residues: 1-334 <DIE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Molecule type: DNA
A; Residues: 1-334 <BIS>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Cross-references:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Gene: SGD: DMC1; ISC2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Cross-references: EMBL:U18922; NID:g603405; PIDN:AAB64706.1; PID:g603420;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Accession: S50682
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R;Dietrich,
                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                          Best
                                                                                                                                                                                                                                                                                                                                                                Query Match
  196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301 GDPTRPIG---GHILAHSATLRVYLRKGKGGKRVARLIDAPHLPEGEAVFRITEKGIED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241 LLIVDSLTSHFRSEYIGRGALAERQQKLAKHLADLHRLANLYEIAVFVTNQVQARPDAFF 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           155 AVINYMEKFLREHKDVRIVIIDSVTFHFRQDF---EDLALRTRVLSGLSLKLMKIAKTYN 211
                                                                                                       156
                                                                                                                                                       95
                                                                                                                                                                                                           96
                                                                                                                                                                                                                                                         35 ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID
                                                                                                                                                                                                                                                                                                                                          Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TEGSFQLTLALGDSWSHSCTNRLILH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRD 282
                                                                                                                                                                                                        LSTGSKQLDSILGGGIMTMSITEVFGEFRCGKTQMSHTLCVTTQLPREMGGGEGKVAYID 155
ELVEQLGEEL-SSGDYRLIVVDSIMANFRVDYCGRGELSERQQKLNQHLFKLNRLAEEFN
                                                                                                       TEGTFRPERIKQIAEG-
                                                                                                                                                     TEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQI 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                F.S.
                                                                                                                                                                                                                                                                                                                  87;
                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SGD:S0000981; MIPS:YER179w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MIPS:YER179w
                                                                                                                                                                                                                                                                                                                                          22.0%;
33.5%;
                                                                                                                                                                                                                                                                                                             46;
                                                                                                                                                                                                                                                                                                                          Score 337; Ub 2,
                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PIDN: AAA34571.1;
                                                                                                         --YELDPESCLANVSYARALNSEHQM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Escherichia coli recA required
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  #text_change 20-Jun-2000
                                                                                                                                                                                                                                                                                                                                                                   Length 334;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9163
                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        that
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     is homologous with a mei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PID:g171401
                                                                                                                                                                                                                                                                                                                  34;
                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Wei,
  254
                                                                                                         195
                                                                                                                                                                                                                                                              94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSPDB:GN0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Y.; Taylo
                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cerevi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for
```

```
A;Molecule type: mRNA
A;Residues: 1-340 <SAT>
A;Cross-references: DDBJ:D58419; NID:g961475; PIDN:BAA09590.1; PID:g961476
A;Cross-references: DDBJ:D58419; Nishimune, Y.; Morita, T.
A;Experimental source: testis
R;Habu, T.; West, A; Nishimune, Y.; Morita, T.
Nucleic Acids Res. 24, 470-477, 1996
A;Title: The mouse and human homologs of DMC1, the yeast meiosis-specific homolo
A;Reference number: S62353; MUID:98173646
A;Accession: S62353
A;Status: preliminary
A;Molecule type: mRNA
A;Residues: 1-340 <HABb
A;Cross-references: EMBL:D64107; NID:g987666; PIDN:BAA10969.1; PID:g1321647
C;Comment: This protein participates in the meiotic recombination process during
C;Genetics:
A;Gene: MmLim15
C;Superfamily: yeast DNA repair protein RAD51
C;Keywords: nucleotide binding; P-loop; spermatogenesis; testis
F;126-133/Region: nucleotide-binding motif A (P-loop)
F;219-224/Region: nucleotide-binding motif B
                                                                  RESULT
S62354
meiosis-specific recombination protein DMC1 - N;Alternate names: meiosis-specific RecA-like C;Species: Homo sapiens (man)
                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                               В
                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                      20
                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                             Ω
                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  R:Sato, S.; Kobayashi, T.; Hotta, Y.; Taba
DNA Res. 2, 147-150, 1995
A;Title: Characterization of a mouse reca-
A;Reference number: JC4191; MUID:96038268
A;Accession: JC4191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              meiosis-specific recombination protein DMC1 homolog - mouse C;Species: Mus musculus (house mouse) C;Date: 03-Sep-1995 #sequence_revision 27-Oct-1995 #text_chcC;Accession: JC4191; S62353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                        210
                                                                                                                                                            317
                                                                                                                                                                                                                                                 260
                                                                                                                                                                                                                                                                                                                                      200
                                                                                                                                                                                                                                                                                                                                                                                154
                                                                                                                                                                                                                                                                                                                                                                                                                           160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        34
                                                                                                                                                          DSPEMPENEATFAITAGGIGDA
                                                                                                                                                                                                 KSPSLPVASAPYAVTGKGIRDA 283
                                                                                                                                                                                                                                               YNVAVFVTNQMT---ADPGATMTFQADPKKPIGGHILAHASTTRISLRKGRGELRIAKIY
                                                                                                                                                                                                                                                                                                                                  MELLDYVAAKFHEEAGIFKLLIIDSIMALFRVDFSGRGELAERQQKLAQMLSRLQKISEE 259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HITTGSQEFDKLLGGGIESMAITEAFGEFRTGKTQLSHTLCVTAQLPGTGGYSGGKIIFI 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYI 93
                                                                                                                                                                                                                                                                                      YNLAVVLLNQVTTKFTEGSFQLTLAL-----GDSWSHSCTNRLILH-WNGNERYAHLD 261
                                                                                                                                                                                                                                                                                                                                                                           IAVINYM-EKFLREHKDVRIVIIDSVTFHFRQDFE----DLALRTRVLSGLSLKLMKIAKT 209
                                                                                                                                                                                                                                                                                                                                                                                                                         DTENTFRPDR-----LRDIADRFNVDH-----EAVLDNVLYARAYTSEHQ 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                DTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQ 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VAVFLTNQVQS--DPGASALFASADGRKPIGGHVLAHASATRILLRKGRGDERVAKLQDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LAVVLLNQVTTKFTEGSFQLTLAL--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PSLPVASAPYAVTGKGIRDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PDMPEKECVYVIGEKGITDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   43;
                                                                                                                                                       338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 314.5; DB 2;
Pred. No. 2.1e-19;
3; Mismatches 97;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Y.; Tabata,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              recA-like gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----GDSWSHSCTNRLILH-WNGNERYAHLDKS
                    protein;
                                           human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the yeast meiosis-specific homologous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                specifically
                    protein Lim15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             340;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     02-Feb-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              expressed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         during
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                testis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mouse
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 rec
```

```
R;Kobayashi, T.; Kobayashi, E.; Sato, S.; Hotta, DNA Res. 1, 15-26, 1994
A;Title: Characterization of cDNAs induced in me:
                                                                                                                                                                                                                                                                                                                RESULT
JC2214
A;Cross-references: DDBJ:D21821; NID:g431167; C;Superfamily: yeast DNA repair protein RAD51
                                           A; Molecule type: mRNA
A; Residues: 1-349 < KOB>
                                                                                     A; Status: preliminary
                                                                                                            A; Reference number: PC2136; A; Accession: JC2214
                                                                                                                                                                                                                   C; Accession: JC2214
                                                                                                                                                                                                                                           C; Date: 04-Sep-1998 #sequence_revision 04-Sep-1998 #text_change 20-Jun-2000
                                                                                                                                                                                                                                                                    hypothetical 38.3K protein, LIM15 - trumpet lily C; Species: Lilium longiflorum (trumpet lily)
                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C;Superfamily: yeast DNA repair protein RALC;Keyerds: DNA binding; meiosis; nucleottic F;126-133/Region: nucleottide-binding motif F;219-223/Region: nucleotide-binding motif
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Experimental source: testis C;Comment: This protein plays an essential role
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Molecule type: mRNA
A;Residues: 1-36,'I',38-182,'P',184-340 <SAT>
A;Cross-references: DDBJ:D63882; NID:g1066000; PIDN:BAA09932.1; PID:g1066001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNA Res. 2, 183-186, 1995
A;Title: Expression profiles of a human gene identified
A;Reference number: JC4333; MUID:96127532
A;Accession: JC4333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Reference number: S62353; MUID:96173646
A; Accession: S62354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               C;Date: 23-Jul-1996 #sequence_revision 13-Mar-1997 #text_change 02-Feb-2001 C;Accession: S63354; JC4333 R;Habu, T.; Taki, T.; West, A.; Nishimune, Y.; Morita, T. Nucleic Acids Res. 24, 470-477, 1996 A;Title: The mouse and human homologs of DMC1, the yeast meiosis-specific harmonia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         R; Sato, S.; Seki,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: EMBL:D64108; NID:g987656; A;Experimental source: testis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Residues: 1-340 < HAB>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Molecule type: mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: nucleic acid sequence not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                       307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hsc01
                                                                                                                                                                                                                                                                                                                                                                                                     RGELRIAKIYDSPEMPENEATFAITAGGIGDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                 NGNERYAHLDKSPSLPVASAPYAVTGKGIRDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LSRLQKISEEYNVAVFVTNQMT----ADPGATMTFQADPKKPIGGHILAHASTTRISLRKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLAL-----GDSWSHSCTNRLILH-W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               YARAYTSEHQMELLDYVAAKFHEEAGIFKLLIIDSIMALFRVDFSGRGELAERQQKLAQM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YFRICSYTEQIAVINYM-EKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGL 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GYPGGKIIFIDTENTFRPDR------LRDIADRFNVDH-------DAVLDNVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIY 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EYSEKRKMVFHITTGSQEFDKLLGGGIESMAITEAFGEFRTGKTQLSHTLCVTAQLPGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ELSQK-----HITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N.; Hotta, Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20.5%;
                                                                                                                                 MUID:96051386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tabata, S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 313;
Pred. No. 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RAD51
                                                                                                                                                                                                                                                                                                                                                                                                       338
                                                                                                                                                                                                                                                                                                                                                                                                                                                 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A (P-loop)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   binding;
                                                                                                                                                        meiotic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 2;
.8e-19;
                       PIDN: BAA04845.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PIDN:BAA10970.1; PID:g1321636
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        in meiotic recombination
                                                                                                                                                                                                   Y.; Miyajima,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 340;
                                                                                                                                                     prophase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   P-loop; testis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           structural homologue
                                                                                                                                                                                                 N.; Tanaka, A.;
                       PID: 9431168
                                                                                                                                                        'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             40;
                                                                                                                                                        lily microsporocyte
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  homologous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                   Tabata
```

```
δÃ
                                                                                      В
                                                                                                                              δÃ
                                                                                                                                                                              Вb
                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C;Species: Glycine max (soybean) C;Date: 11-Jun-1999 #text_change 23-Jul-1999 C;Date: 11-Jun-1999 #sequence_revision 11-Jun-1999 #text_change 23-Jul-1999 C;Accession: T08838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뭥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Description: recombinase C;Superfamily: yeast DNA r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Cross-references: EMBL:U66836; NID:g1518156; PID:g1518157 C;Function:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          R:Hadi, M.Z.; Finer, J.J.
submitted to the EMBL Data Library, August 1996
A;Description: RecA like gene from soybean.
A;Reference number: Z16485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Residues: 1-345 <HAD>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Molecule type: mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Status: preliminary; translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Accession: T08838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RecA/Rad51/DMC1-like protein - soybean
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Superfamily: yeast DNA repair protein RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                         149
308
                                                                                                                                                                                   189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          153 VSTQLPVSMHGGNGKVAYIDTEGTFRPDRIVPIAERFGMD--
                                                                                                                                                                                                                                                                                                                                                                    93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      252 RQQKLAQMLSRLTKIAEEFNVAVYMTNQVIADPGGGMFISDPKKPAGGHVLAHAATVRLM 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 192 RTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSF---QLTLALGDSWSHSCTNRLI 248
                                                                                                                                                                                                                                                                                                                       75
                                                                                                                                                                                                                                                                                                                                                                                                             15 YVSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLA 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              97 YITGS----DVLLKRKSVIRITTGSQALDELLGGGIETLQITEAFGEFRSGKTQIAHTLC 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15 YVSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLA 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local
FRKGKGEQRICKVFDAPNLPEAEAVFQITAGGIADA 343
                                        LH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRDA 283
                                                                                                                                                                            PGAVLDNIIYARAYTYEHQYNLLLGLAAKMSE-EPFRLLIVDSVIALFRVDFSGRGELAD 247
                                                                                                                                                                                                                                                                       VSTQLPTNMRGGNGKVAYIDTEGTFRPDRIVPIAE------RFGMD 188
                                                                                                                                                                                                                                                                                                                INVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQ 134
                                                                                                                                                                                                                                                                                                                                                                YITGS----DALLKRKSVIRITTGSQALDELLGGGVETSAITEAFGEFRSGKTQLAHTLC 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRDA 283
                                                                                      RQQKLAQMLSRLIKIAEEFNVAVYMTNQVISDPGGGVFVTDPKKPAGGHVLAHAATVRLM
                                                                                                                              RTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSF---QLTLALGDSWSHSCTNRLI 248
                                                                                                                                                                                                                       PERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLAL 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LRKGKGEQRVCKIFDAPNLPESEAVFQITPGGVADA 347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----LDNIIYARAYTYEHQYNLLLALAAKMSE-EPFRLLIVDSVIALFRVDFSGRGELAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQ 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20.5%; Score 313; DB 2; Length 349; 33.3%; Pred. No. 2.9e-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 312; DB 2;
Pred. No. 3.4e-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches 108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 345;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels 32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----- 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               251
                                                                                                                                                                                                                                                                                                                                                                                                                                                           6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7;
```

RESULT 12 E64408 DNA repair

repair protein

radA -

Methanococcus

jannaschii

The Caenorhabditis elegans RAD51 homolog is transcribed into two alternative

```
A;Cross-references: EMBL:AB011382; NID:g2913896; PIDN:BAA24982.1; PID:g2913897 R;Rinaldo, C.; Ederle, S.; Rocco, V.; La Volpe, A. Mol. Gen. Genet. 260, 289-294, 1998
                                                                                                                                                                  A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: mRNA
A;Residues: 1-357 <TAK>
                                                                                                                                                                                                                                                                                                                               R;Takanami, T.; Sato, S.; Ishihara, T.; Katsura, I.; Takahashi, H.; Higashitani, A. DNA Res. 5, 373-377, 1998
A;Title: Characterization of a Caenorhabditis elegans recA-like gene Ce-rdh-1 involve A;Reference number: Z21672; MUID:99156232
A;Accession: T37305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          rad51 protein, short isoform - Caenorhabditis elegans
C;Species: Caenorhabditis elegans
C;Date: 03-Dec-1999 #sequence_revision 03-Dec-1999 #text_change 21-Jul-2000
C;Accession: T37305; T43059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      R;Sandler, S.T.; Satin, L.H.; Samra, H.S.; Clark, A.J. Nucleic Acids Res. 24, 2125-2132, 1996
A;Title: recA-like genes from three archaean species with A;Reference number: S71093; MUID:96251095
A;Accession: S71095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      rson, J.D.; Sadow, P.W.; Hanna, M.C.; Cotton, M.D.; Roberts, K.M.; Hurst, M.A. Science 273, 1058-1073; 1996
A;Authors: Kaine, B.P.; Borodovsky, M.; Klenk, H.P.; Fraser, C.M.; Smith, H.O.; A;Title: Complete genome sequence of the methanogenic archaeon, Methanococcus ja A;Reference number: A64300; MUID:96337999
A;Accession: E64408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C;Species: Methanococcus jannaschii C;Species: Methanococcus jannaschii C;Date: 13-Sep-1996 #sequence_revision 13-Sep-1996 #text_change 21-Jul-2000 C;Accession: E64408; S71095; S71096
R;Bult, C.J.; White, O.; Olsen, G.J.; Zhou, L.; Fleischmann, R.D.; Sutton, G.G.; Bla; Reich, C.I.; Overbeek, R.; Kirkness, E.F.; Weinstock, K.G.; Merrick, J.M.; Glodek, Reich, C.I.; Overbeek, R.; Kirkness, E.F.; Weinstock, K.G.; Merrick, J.M.; Glodek, Reich, C.I.; Overbeek, R.; Kirkness, E.F.; Weinstock, K.G.; Merrick, J.M.; Glodek, Reich, C.I.; Overbeek, R.; Kirkness, E.F.; Weinstock, K.G.; Merrick, J.M.; Glodek, Reich, C.I.; Overbeek, R.; Kirkness, E.F.; Weinstock, K.G.; Merrick, J.M.; Glodek, Reich, C.I.; Overbeek, R.; Kirkness, E.F.; Weinstock, K.G.; Merrick, J.M.; Glodek, Reich, C.I.; Overbeek, R.; Kirkness, E.F.; Weinstock, K.G.; Merrick, J.M.; Glodek, R.G.; Merrick, R.G.; Merri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Map position: FOR791863-792921
C;Superfamily: yeast DNA repair protein RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Cross-references: EMBL:U45312 C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Molecule type: DNA
A; Residues: 1-352 <BUL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Gene: radA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Molecule type: DNA
A; Residues: 33-352 <SA2>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Status: preliminary; nucleic acid sequence not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Status: preliminary; nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Cross-references: GB:U67531; GB:L77117; NID:g2826342;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     172 IVIIDSVTFHFRQDF----EDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTK--FTE 226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61 VPGVGKTQLGIQLAINVQIPVECGGLGG------KAVYIDTEGSFMVERVYQIAEGC 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 93 LGFKSGT-----EVLSQRKNIW------KLSTGSKNLDEILGGGLESQSVTEFAG 136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 MGDQSGSRNGPQQKYVSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGG 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPSEQAIG-GHIVGHAATFRIFLRKAKGDKRVAKLYDSPHLPDAEAMFRITEKGIHD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSFQLTLALGDSWSHSCTNRLILH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRD 282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MFGSGKTQIAHQACVNLQCPERIVADDAIKDEILNEPKAVYIDTEGTFRPERIVQMAEAL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LVIVDSLTSTFRTEYIGRGKLAERQQKLGRHMATLNKLADIYNCVVIVTNQVAARPDALF 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVR 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---GLDGNEVLNNIFVARAYNSDMQMLYAENVENLIREGHNIK 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 312; DB 2; Length 352; Pred. No. 3.5e-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PIDN: AAB98875.1; PID: g1591553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     putative protein products
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         jannasc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Woese
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Blak
```

Q В 20 В δÃ 밁 δõ 밁

```
A;Reference number: 222307; MUID:99077299
A;Accession: T43059
A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: mRNA
A;Residues: 1-357 <RIN>
A;Residues: 1-357 <RIN>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        hypothetical protein Y43C5A.6 - Caenorhabditis elegans
C:Species: Caenorhabditis elegans
C:Date: 15-Oct-1999 #sequence_revision 15-Oct-1999 #text_change 21-Jan-2000
C:Accession: T26822
R:White, S.
submitted to the EMBL Data Library, June 1998
A:Accession: T26822
A:Accession: T26822
A:Status: preliminary; translated from GB/EMBL/DDBJ
A:Status: preliminary; translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Cross-references: EMBL:AL023838; PIDN:CAA19500.1; GSPDB:GN00022; CESP:Y43C5A.6
A;Experimental source: clone Y43C5A
C;Genetics:
A;Gene: CESP:Y43C5A.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C; Superfamily: yeast DNA repair protein RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Gene: rad51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Cross-references: EMBL:AF061201; NID:g3786401; PIDN:AAD10194.1; PID:g3786402
밁
                                      Ş
                                                                                      밁
                                                                                                                             QΥ
                                                                                                                                                                               В
                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                     A; Introns: 31/3; 125/3; 174/3; 227/2; 258/1; C; Superfamily: yeast DNA repair protein RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
A; Residues: 1-391 <WIL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                             A; Map position: 4
A; Introns: 31/3; 125/3; 174/3; 227/2; 258/1; 350/2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                             155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   337 LPEAEATYSITNHGIEDA 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                118 IRTGSASLDRLLGGGIETGSITEVYGEYRTGKTQLCHSLAVLCQLPIDMGGGEGKCMYID 177
                                                                                                                                                                               152 IRTGSASLDRULGGGIETGSITEVYGEYRTGKTQLCHSLAVLCQLPIDMGGGEGKCMYID 211
252 ALIIRAGAMMSESR-YAVVIVDCATAHFRNEYTGRGDLAERQMKLSAFLKCLAKLADEYG
                                                                                      212 TNATFRPERIIAIAQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       95
                                                                                                                                    95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                35 ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID 94
                                                                                                                                                                                                                           35 ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               14
                                      AVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLMKIAKTYN 211
                                                                                                                               TEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQI 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LPVASAPYAVTGKGIRDA 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VAVIITNQVVAQVDGGASMFQADAKKPIGGHIIAHMSTTRLYLRKGKGENRVAKMVQSPN 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LAVVLLNQVTTKFTEGS--FQLTLAL---GDSWSHSCTNRLILH-WNGNERYAHLDKSPS 265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ALIIRAGAMMSESR-YAVVIVDCATAHFRNEYTGRGDLAERQMKLSAFLKCLAKLADEYG 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE----DLALRTRVLSGLSLKLMKIAKTYN 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQI 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              87;
                                                                                                                                                                                                                                                                           l Similarity 33. 87; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                         20.2%; score 309; DB 2; Length 391; 33.7%; Pred. No. 7.3e-19; vative 36; Mismatches 105; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 309; DB 2; Pred. No. 6.5e-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches 105;
                                                                                         -- RYNMDSAHVLENIAVARAYNSEHLM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 357;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              30;
                                                                                                                                                                                                                                                                             30;
                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
310
                                                                                         251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6
                                                                                                                                                                                                                                                                             6.
```

```
R.Diener, A.C.; Fink, G.R. Genetics 143, 769-776, 1996
A;Title: DLH1 is a functional Candida albicans homologue of the meiosis-specific gene A;Reference number: S70390; MUID:96363911
A;Accession: S70390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ОÃ
                                                                                DЬ
                                                                                                                       Qy
                                                                                                                                                                   В
                                                                                                                                                                                                           ğ
                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                  γ
                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Introns: 35/3; 67/3
C; Superfamily: yeast DNA repair protein RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Molecule type: DNA
A; Residues: 1-324 <DIE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C; Accession: S70390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C;Date: 06-Dec-1996 #sequence_revision 13-Mar-1997 #text_change 29-Sep-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DMC1/LIM15 homolog 1 - yeast (Candida albicans)
C;Species: Candida albicans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Cross-references: EMBL:U39808; NID:g1145715; PIDN:AAC49400.1; PID:g1145716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              311 VAVIITNQVVAQVDGGASMFQADAKKPIGGHIIAHMSTTRLYLRKGKGENRVAKMVQSPN 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            212 LAVVLLNQVTTKFTEGS--FQLTLAL---GDSWSHSCTNRLILH-WNGNERYAHLDKSPS
                                                                                                                                                                                                                                                           146
301
                                                                                   243
                                                                                                                          209 TYNLAVVLLNQVTTKFTEGSFQLTLAL------GDSWSHSCTNRLILH-WNGNERYAHL 260
                                                                                                                                                                      184
                                                                                                                                                                                                                 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             371 LPEAEATYSITNHGIEDA 388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    266 LPVASAPYAVTGKGIRDA 283
                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity 33.2 nes 87; Conservative
                                                                                                                                                                                                                                                                                                                                                86
                                                                                                                                                                                                                                                                                                                                                                                     34 HITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYI 93
                                                                                                                                                                                                                                                                                                       94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DLH1
QDSPNMPEKECVYVIGEGGIKD 322
                                         DKSPSLPVASAPYAVTGKGIRD 282
                                                                                   DYNIAVFLTNQVQS--DPGASALFAAADGRKPVGGHVLAHASATRILLRKGRGEERVAKL
                                                                                                                                                                      HQIELVEQLGNELAE-GTFRLLIVDSIMACFRVDYSGRGELNERQQKLNQHLSNLTRVAE 242
                                                                                                                                                                                                               EQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLMKIAK 208
                                                                                                                                                                                                                                                           DTEGTFRPDRIRSIAERYGVDADIC------------------LENISYARALNSE 183
                                                                                                                                                                                                                                                                                                     DTEGSFMVERVYQIAE--GCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYT 151
                                                                                                                                                                                                                                                                                                                                              HITTGSKQFDEILGGGIQSMSITEVFGEFRCGKTQLCHTLCVAAQLPTDMGGGEGRVAYI 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     35/3; 67/3
                                                                                                                                                                                                                                                                                                                                                                                                                                                      19.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                      38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 304; DB 2;
Pred. No. 1.5e-18;
                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                        99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 324;
                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                        38;
                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                        7;
```

Search completed: October 1, 2001, 16:28:37 Job time: 70 sec

•				
•				
		·		
			·	
			•	
	•			

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OM nucleic -
                                                                                                                                                                                                                                       Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Run on:
                      0 0 0 0 0 0
                                                                                                                                                                                                                    No.
                                                                                                                                                                                                                                                                                                      Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                    Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         length:
     100.0
88.6
84.3
12.1
6.1
6.1
6.1
6.1
6.1
                                                                                                                                                                                                                  Match Length
                                                                                                                                                                                                                                                                                                                                                                                  9:
110:
112:
113:
114:
115:
116:
116:
119:
220:
221:
                                                                                                                                                                                                                                       Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           October 2, 2001, 05:00:54; Search time 124.96 Seconds (without alignments) 7406.586 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IDENTITY_NUC
Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-537-654-1
1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               N_Geneseq_0601:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             730101 segs, 313950809 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                          /SIDS1/gcgdata/geneseq/geneseqn/NA1991.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1992.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1993.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1993.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1995.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1995.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1997.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1998.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1999.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1900.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA2000.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /SIDS1/gcgdata/geneseq/geneseqn/NA1980.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1981.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1982.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1983.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1984.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1985.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /SIDS1/gcgdata/geneseq/geneseqn/NA1986.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1987.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1988.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /SIDS1/gcgdata/geneseq/geneseqn/NA1989.DAT:*
/SIDS1/gcgdata/geneseq/geneseqn/NA1990.DAT:*
                                                                                                                             1459
1325
     936
936
936
936
936
                                                                                                                                                                                                                      DВ
                                                                                                                                                                                                                      IJ
   AAF58257
AAF58259
AAF58262
AAF58255
AAF58255
                                                                                                                                              AAD02118
AAD02120
AAD02119
                                                                                          AAF58252
AAF58254
                                                                                                                             AAZ52425
                                                                                                                                                                                                                                                                          SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1460202
Maize RAD51 orthol
Maize RAD51 orthol
Maize RAD51 orthol
HTRM clone 2398682
Oligonucleotide D1
Oligonucleotide D1
Oligonucleotide D1
Oligonucleotide D2
Oligonucleotide D2
Oligonucleotide D2
Oligonucleotide D2
Oligonucleotide D1
Oligonucleotide D1
Oligonucleotide D1
                                                                                                                                                                                                                  Description
```

Ω.	AAC79990	21	553	ω	48.6	45
cDNA encoding a de	AAA75749	21	443			44
Human PRO1105 (UNQ	AAF44206	22	1484			43
Membrane-bound pro	AAZ65060	21	1483			42
Stem cell leukaemi	AAQ05330	11	4199			41
	AAQ04035	11	4091		49.8	40
Human interleukin-	AAT15758	17	1641			39
Human secreted pro	AAC93480	21	1522			38
Human secreted pro	AAC59201	21	876		50.8	37
Human ORFX ORF1590	AAC76035	21	3447		51	36
Human H38087 (clon	AAC64478	21	2737		52	35 5
	AAC78089	21	887		2	34
Human ORFX ORF1667	AAC76112	21	2422		Ν	<b>ω</b> <b>ω</b>
Probe #56 used in	AAF54480	22	2639		2	32
_	AAA37137	21	2639		Ν	31
Human PRO1788 nucl	AAC58108	21	2639		2	30
Human ORFX ORF2030	AAC76475	21	3994		ω	29
TRP-1 protein codi	AAT42903	17	3776		ω	28
Mouse gene partici	AAQ64088	15	1755		5	27
Mouse Rad51 gene,	AAQ91761	16	1408		55.8	26
ß	AAC47934	21	1362		5	25
	AAA37710	21	2229		7.	24
Human Rad51 gene,	AAQ91763	16	1682		7.	23
Glycine max RAD51	AAD02316	22	1219	4.3	.~	22
	AAZ11872	20	1574		64.4	21
ZmRAD51B nucleotid		20	1020		4	20
	AAD02318	22	1585		σ	19
ZmRAD51A cDNA clon	AAZ11868	20	1568		5	18
ZmRAD51A nucleotid	AAZ11866	20	1020		<u>ب</u>	17
Oligonucleotide D1	AAF58255	22	938		9.	16
Oligonucleotide D2	AAF58262	22	936	•	9	15
	AAF58259	22	936	٠	9	14
Oligonucleotide D1	5825	22	936	6.1	89.8	13
	AAF58254	22	936		9	12

a

## ALIGNMENTS

```
RESULT
AAD02118
CDS
                                                                                                                                                                                  Maize; RAD51 orthologue; RAD52 epistasis group; double strand break; DSB; homologous recombination; transformation; gene targetting; transgenic plant; DNA repair; ss.
WPI; 2001-016092/02
                                                                                                                                                                   Zea mays.
                                                                                                                                                                                                                       Maize RAD51 orthologue #1 cDNA
                                                                                                                                                                                                                                         28-MAR-2001
                                                                                                                                                                                                                                                          AAD02118;
                                                                                                                                                                                                                                                                           AAD02118 standard; cDNA; 1474 BP
                Mahajan PB,
                                                   05-MAY-1999;
                                                                    05-APR-2000; 2000WO-US09010
                                                                                     16-NOV-2000.
                                (PION-) PIONEER HI-BRED INT INC
                                                                                                      WO200068370-A2.
                Shi J;
                                                                                                                                                                                                                                         (first entry)
                                                   99US-0132582.
                                                                                                                /product=
                                                                                                                                         Location/Qualifiers 310..1194
                                                                                                                        "Maize RAD51 orthologue protein #1"
```

```
AAY71974
```

amplification primers maize RAD51 polynucleotides, useful for e.g. controlling ombination or transformation efficiency in plants, or as platication primers for detecting, quantifying or isolating probes gene or

Claim 1; Page 68-69; 76pp; English.

The present sequence is a maize RAD51 orthologue #1 cDNA. RAD51 is one of the genes of the RAD52 epistasis group that is involved in double strand breaks (DSBs) repair by homologous recombination. Control of homologous recombination by modulating RAD51 is used for improving transformation and gene targetting in transgenic plants. The RAD51 nucleotide may be used as probes or amplification primers for detecting, quantifying or isolating gene transcripts, in detecting deficiencies in the mRNA level during screening for desired transgenic plants, for detecting gene mutations, for monitoring upregulation of expression or changes in enzyme activity, for detecting any number of allelic variants, or thologues or paralogues of the gene, or for site directed mutagenesis in enzyme activity, also be used for recombinant expression of its encoded polypeptide, or for use as immunogen in preparing and/or screening of antibodies, and in sense or antisense suppression of one or more genes in a host cell, tissue or plant. The RAD51 proteins may be used in assays to agonise or antagonise the enzyme function, or as

Sequence 1474 BP; 415 A; 337 Ç 369 G; 353 T; 0 other;

100.0%;

Score 1474; Pred. No. 0;

DВ 22;

Length 1474;

Qy Qy 밁 뫄 밁 Qy Дb δÃ В ρy 밁 Š 밁 Q 밁 γ Q В В Qy Query Match
Best Local Similarity
Matches 1474; Conser 541 541 481 481 421 421 361 361 301 301 241 241 181 181 121 121 61 61 1 tcgacccacgcgtccgcacttgactcccagtctcccactgtgcgcagttcgcttggtccc caaatcccagtggaatgtggtggccttggtgggaaagcagtttatatagatacagagggc caaatcccagtggaatgtggtggccttggtgggaaagcagtttatatagatacagagggc ggttctggtgacctcaatgacatacttggtggcgggattcactgcaaagaagttactgag ggagcccagaatgcctgggatatgttctctgatgagctgtcacagaaacacatcactact gcaatcaccatgggagatcaatctggctctagaaatggaccacaacagaagtacgtttca gatactgaaatccgcactgcagttctcttcttcccccaatcagtaccacctctccaagtg gagcggttgtggaggcagatatgagaggtggaggtgggctacaacggggtcggcggctgtga ggttctggtgacctcaatgacatacttggtggcgggattcactgcaaagaagttactgag ggagcccagaatgcctgggatatgttctctgatgagctgtcacagaaacacatcactact gcaatcaccatgggagatcaatctggctctagaaatggaccacaacagaagtacgtttca gatactgaaatccgcactgcagttctcttcttcccccaatcagtaccacctctccaagtg gagcggttgtggaggcagatatgagaggtggaggtggctacaacgggtcggcggctgtga cctaagcgacagcggcgtcgacgtaagcggctgcgtgggcgccaccgacggaggctac cctaagcgacagcggcgtcgacgtaagcggctgcgtggcgccaccgacggaggctac 180 cggagccccaaaggcggcggtgagccggagcccggagacgacggcgcgcgactcccc tcgacccacgcgtccgcacttgactcccagtctcccactgtgcgcagttcgcttggtccc Conservative 0; Mismatches 0; Indels 0, Gaps 600 480 420 360 180 360 240 60 60 0;

> Qy B δÃ В δÃ В δÃ В Qγ B Q В Qγ В Qy 밁 Qy В ρy Вþ Qy 밁 Q DЬ ρy DЬ Qy В γQ 1321 1381 1261 1141 1261 1201 1141 1081 1021 1201 1081 961 961 901 841 841 901 781 781 721 661 601 tttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcgggcaaaa ggactagtgaggtgagactggagaatagtaccattttgttgattctcagttgctttgtgc aaccaagtcactactaaatttacagaagggtcatttcaattgactcttgctctaggtgac ttttgtatctgaacatctggcccatcgtacattcagtaaagcctataatagcgggcaaaa cgttggctaccaaccataagagagaagtaaatacaacagaacaggctaatatagtg cgttggctaccaaccatcagagagagagataaatacaacagaaacaggctaatatagtg ggactagtgaggtgagactggagaatagtaccattttgttgattctcagttgctttgtgc tggtgtcaagcacttgtatgtccactacgctcctgcagctttcttcgccatggatctttt tggtgtcaagcacttgtatgtccactacgctcctgcagctttcttcgccatggatctttt aaaagggattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattct aaagggattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattct gcacatcttgataagtctccttcacttccagtagcctcagcaccgtatgcagtgacaggc gcacatcttgataagtctccttcacttccagtagcctcagcaccgtatgcagtgacaggc aaccaagtcactactaaatttacagaagggtcatttcaattgactcttgctctaggtgac ggattatcattgaagttaatgaagattgcaaagacatataacttggcagttgtcttgttg ggattatcattgaagttaatgaagattgcaaagacatataacttggcagttgtcttgttg gttactttccactttcgacaagattttgaagatctggcactgaggaccagagtgctaagt gttactttccactttcgacaagattttgaagatctggcactgagggaccagagtgctaagt aactacatggagaagttcctcagagagcataaagatgtgcgtatagttattattgatagt aactacatggagaagttcctcagagagcataaagatgtgcgtatagttattattgatagt agtttcatggttgaacgtgtctaccagattgctgaagggtgtattaggggacatactggag ttcctggcggatatctattacttccggatatgcagttacaccgaacaaattgcagtcata ttcctggcggatatctattacttccggatatgcagttacaccgaacaaattgcagtcata cactttccgcacagccatgagaagtcctcttctgtccaaaaacaattacagcctgagcgt cactttccgcacagccatgagaagtcctcttctgtccaaaaacaattacagcctgagcgt agtttcatggttgaacgtgtctaccagattgctgaagggtgtattagggacatactggag 1474 1440 1260 1200 1200 1380 1320 1140 1140 1440 1080 1080 1020 960 960 900 900 840 840 780 720 660

RESULT AAD02120

AAD02120 standard; cDNA; ВP

28-MAR-2001 (first entry)

Maize orthologue #3 cDNA

RAD51 orthologue; RAD52 epistasis group; double strand

```
밁
                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                         nucleotide may be used as probes or amplification primers for detecting, quantifying or isolating gene transcripts, in detecting deficiencies in the mRNA level during screening for desired transgenic plants, for detecting gene mutations, for monitoring upregulation of expression or changes in enzyme activity, for detecting any number of allelic variants, orthologues or paralogues of the gene, or for site directed mutagenesis in eukaryotic cells. It may also be used for recombinant expression of its encoded polypeptide, or for use as immunogen in preparing and/or screening of antibodies, and in sense or antisense suppression of one or more genes in a host cell, tissue or plant. The RAD51 proteins may be used in assays to agonise or antisponise the enzyme function, or as immunogens or antigens to obtain antibodies.
                                                                                                                                                                                                                                                                                                                                                                               Sequence 1333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               of the genes of the RAD52 epistasis group that is involved in doub strand breaks (DSBs) repair by homologous recombination. Control of homologous recombination by modulating RAD51 is used for improving transformation and gene targetting in transgenic plants. The RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       New maize RAD51 polynucleotides, useful for e.g. controlling recombination or transformation efficiency in plants, or as pamplification primers for detecting, quantifying or isolating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mahajan PB,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    05-APR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      16-NOV-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HUSA-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            homologous recombination; transformation; transgenic plant; DNA repair; ss.
                                                                                                                                                                                                                                                           142
                       181
                                                                                     121
                                                                                                                                                                                         202
                                                                                                                                                         61
                                                                                                                                                                                                                                                                                             Local Similarity
mes 1315; Conserv
                                                                                                                                                                                                                         _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       present sequence is a maize RAD51 orthologue #3 cDNA. RAD51 is one the genes of the RAD52 epistasis group that is involved in double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mays
                                   tctggctctagaaatggaccacaacagaagtacgtttcaggagcccagaatgcctgggat
                                                                                                   gttctcttcttcccccaatcagtaccacctctccaagtggcaatcaccatgggagatcaa
                                                                                                                                                                       tgagaggtggaggtggctacaacgggtcggcggctgtgagatactgaaatccgcactgca
                                                                                                                                                                                                                                       cgacgtaagcggctgcgtggcgccaccgacggaggctacgagcggttgtgggaggcagata
                                                                                   gttctcttcttcccccaatcagtaccacctctccaagtggcaatcaccatgggagatcaa
                                                                                                                                                                                                                       cgacgtaagcggctgcgtggcgccaccgacggaggctacgagcggttgtggaggcagata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2001-016092/02
                   tctggctctagaaatggaccacaacagaagtacgtttcaggagcccagaatgcctgggat
                                                                                                                                                     tgagaggtggaggtggctacaacgggtcggcctgtgagatactgaaatccgcactgca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAY71976.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Page
                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Shi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2000WO-US09010
                                                                                                                                                                                                                                                                                                                                                                               BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         72-74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
169..1053
/*tag= a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product= "Maize RAD51 orthologue
                                                                                                                                                                                                                                                                                                                                                                               377 A;
                                                                                                                                                                                                                                                                                                           98.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         76pp; English.
                                                                                                                                                                                                                                                                                                                                                                               284 C;
                                                                                                                                                                                                                                                                                                         Score 1305.4;
Pred. No. 0;
                                                                                                                                                                                                                                                                                                                                                                               326 G; 345 T; 1 other;
                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene targetting;
                                                                                                                                                                                                                                                                                                                           DB 22; Length 1333;
                                                                                                                                                                                                                                                                                             17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          or isolating
                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein
                                                                                                                                                                                                                                                                                             0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          probes or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gene
                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       of.
                                                                                                                                                       120
                                                                                                                                                                                                                         60
                   240
                                                     381
                                                                                     180
                                                                                                                     321
                                                                                                                                                                                     261
                                                                                                                                                                                                                                                           201
                                                                                                                                                                                                                                                                                             0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
Qy
                                   В
                                                                Qy
                                                                                                   В
                                                                                                                                  Qy
                                                                                                                                                                       밁
                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                     1201
                                                                                                                                                                                                                                                                                                           1021
                                                                                                                                                                                                                                                                                                                                             1162
                                                                                                                                                                                                                                                                                                                                                                                                               1102
                                                                                                                                                                                                                                         1081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1042
                                                                                                                                                                                                                                                                                                                                                                             961
                                                                                                                                                                                                                                                                                                                                                                                                                                                 901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   982
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   922
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       862
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          802
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                682
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                 ccactacgctcctgcagctttcttcgccatggatcttttggactagtgaggtgagactgg
                                                                                                                                                                                                                                                                                                                           agctcaaaccacaagcgagcccgagtaacgtagcattcttggtgtcaagcacttgtatgt
                                                                                                                                                                                                                                                                                                                                                                                           tcacttccagtagcctcagcaccgtatgcagtgacaggcaaagggattagagatgctgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                             acagaagggtcatttcaattgactcttgctctaggtgacagctggtcccactcatgcacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aagattgcaaagacatataacttggcagttgtcttgttgaaccaagtcactactacaattt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gattttgaagatctggcactgaggaccagagtgctaagtggattatcattgaagttaatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       agagagcataaagatgtgcgtatagttattattgatagtgttactttccactttcgacaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ttccggatatgcagttacaccgaacaaattgcagtcataaactacatggagaagttcctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ttccggatatgcagttacaccgaacaaattgcagtcataaactacatggagaagttcctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aagtcctcttctgtccaaaaacaattacagcctgagcgtttcctggcggatatctattac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aagtcctcttctgtccaaaaacaattacagcctgagcgtttcctggcggatatctattac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           taccagattgctgaagggtgtattagggacatactggagcactttccgcacagccatgag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggccttggtgggaaagcagtttatatagatacagagggcagtttcatggttgaacgtgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggtaaaactcaactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          atacttggttggcgggattcactgcaaagtagttactgagatcggtggcgtcccaggggtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          atgttctctgatgagctgtcacagaaacacatcactactggttctggtgacctcaatgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          atgttctctgatgagctgtcacagaaacacatcactactggttctggtgacctcaatgac
                                 ccatcgtacattcagtaaagcctataatagcgggcatatatgtgcttctctgatcaaaaa
                                                                                                   aagagagaagtaaatacaacagaacaggctaatatagtgttttgtatctgaacatctggs
                                                                                                                                     aagagagaagtaaatacaacagaacaggctaatatagtgttttgtatctgaacatctggc
                                                                                                                                                                    ccactacgctcctgctgcttcttcgccatggatcttttggactagtgaggtgagactgg
                                                                                                                                                                                                                                                                                                           agctcaaaccacaagcgagcccgagtaacgtagcattcttggtgtcaagcacttgtatgt
                                                                                                                                                                                                                                                                                                                                                                           tcacttccagtagcctcagcaccgtatgcagtgacaggcaaagggattagagatgctgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 acagaagggtcatttcaattgactcttgctctaggtgacagctggtcccactcatgcacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aagattgcaaagacatataacttggcagttgtcttgttgaaccaagtcactactaaattt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gattttgaagatctggcactgaggaccagagtgctaagtggattatcattgaagttaatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         agagagcataaagatgtgcgtatagttattattgatagtgttactttccactttcgacaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ggccttggtggaaagcagtttatatagatacagagggcagtttcatggttgaacgtgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggtaaaactcaactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        atacttggtggcgggattcactgcaaagaagttactgagatcggtggcgtcccaggggtt
```

δÃ

밁

Qγ 밁 8 Qy

1080

1461

1101

960

1041

840 981 780 921 660

600

540 681 480 621 420

밁

1321

aaaaaaaaaaaaa 1333

```
ρ
                                                                                                                                                                                            The present sequence is a maize RAD51 orthologue #2 cDNA. RAD51 is one control of the genes of the RAD52 epistasis group that is involved in double to strand breaks (DSBs) repair by homologous recombination. Control of homologous recombination by modulating RAD51 is used for improving transformation and gene targetting in transgenic plants. The RAD51 controled may be used as probes or amplification primers for detecting, quantifying or isolating gene transcripts, in detecting deficiencies in the mRNA level during screening for desired transgenic plants, for controled the mRNA level during screening for desired transgenic plants, for controled polypeptide, or for use as immunogen in preparing and/or controled polypeptide, or for use as immunogen in preparing and/or controled polypeptide, or for use as immunogen in preparing and/or controled polypeptide, or for use as immunogen in preparing and/or controled polypeptide, or for use as immunogen in preparing and/or controled polypeptide, or for use as immunogen in preparing and/or controled polypeptide, or for use as immunogen in preparing and/or controled polypeptide, or for use as immunogen in preparing and/or controled polypeptides, and in sense or antiscense suppression of one or more genes in a host cell, tissue or plant. The RAD51 proteins may be compared to antibodies, and the control proteins control to the termination of the control proteins control to the termination of the control proteins control to the termination of the control proteins control proteins control proteins contro
                                                            Query
Best I
                                           Matches 1286;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          New maize RAD51 polynucleotides, useful for e.g. controlling recombination or transformation efficiency in plants, or as pamplification primers for detecting, quantifying or isolating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Maize; RAD51 orthologue; RAD52 epistasis group; double str
homologous recombination; transformation; gene targetting;
transgenic plant; DNA repair; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAD02119
                                                                                                                                          Sequence 1459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mahajan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     05-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           05-APR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Zea mays.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Maize
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (PION-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO200068370-A2
    142
                                                              Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ω
  cgacgtaagcggctgcgtggcgccaccgacggaggctacgagcggttgtgggaggcagata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2001-016092/02.
DB; AAY71975.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1; Page 70-72; 76pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RAD51 orthologue #2
                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIONEER HI-BRED INT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         standard;
                                                                                                                                                                                    or antigens
                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2000WO-US09010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first
                                                                                                                                            BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     99US-0132582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /*tag= a
/product=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers 169..1014
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /*tag=
                                                                                                                                            504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         entry)
                                                            84.3%;
98.9%;
                                                                                                                                            Α;
                                                                                                                                                                                    to obtain antibodies.
                                                                                                                                            288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Maize RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDNA
                                       0,
                                                        Score
Pred.
                                                                                                                                            Ç
                                         ed. No. 0;
Mismatches
                                                                                                                                            326
                                                                             1243.
                                                                                                                                            <u>ი</u>
                                                                                                                                            341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              orthologue
                                                                                                                                            Τ;
                                                                                 DΒ
                                         ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              double strand break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein
                                           Indels
                                                                             Length
                                           11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   probes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene
                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   or
                                           ω
```

```
Ş
                                                                         Q
                                                                                                           DЬ
                                                                                                                                      Qγ
                                                                                                                                                                        B
                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  β
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ŞQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                       1042
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                535
                                                                                                           955
                                                                                                                                                                          895
                                                                                                                                                                                                                                                                    982
                                                                                                                                                                                                                                                                                                  775
                                                                                                                                                                                                                                                                                                                               922
                                                                                                                                                                                                                                                                                                                                                             715
                                                                                                                                                                                                                                                                                                                                                                                                                         655
                                                                                                                                                                                                                                                                                                                                                                                                                                                       802
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ccactacgctcctgcagctttcttcgccatggatctttttggactagtgaggtgagactgg
                                              agctcaaaccacaagcgagcccgagtaacgtagcattcttggtgtcaagcacttgtatgt
                                                            agctcaaaccacaagcgagcccgagtaacgtagcattcttggtgtcaagcacttgtatgt
                                                                                                                         tcacttccagtagcctcagcaccgtatgcagtgacaggcaaagggaattagagatgctgtg
                                                                                                                                                                        aaccggttgattctgcactggaatgggaacgaacgatacgcacatcttgataagtctcct
                                                                                                                                                                                     aaccggttgattctgcactggaatgggaacgaacgatacgcacatcttgataagtctcct 1101
                                                                                                                                                                                                                                     acagaagggtcatttcaattgactcttgctctaggtgacagctggtcccactcatgcacg
                                                                                                                                                                                                                                                  acagaagggtcatttcaattgactcttgctctaggtgacagctggtcccactcatgcacg
                                                                                                                                                                                                                                                                                               aagattgcaaagacatataacttggcagttgtcttgttgaaccaagtcactactaaattt
                                                                                                                                                                                                                                                                                                               aagattgcaaagacatataacttggcagttgtcttgttgaaccaagtcactactaaattt
                                                                                                                                                                                                                                                                                                                                                             gattttgaagatctggcactgaggaccagagtgctaagtggattatcattgaagttaatg
                                                                                                                                                                                                                                                                                                                                                                         gattttgaagatctggcactgaggaccagagtgctaagtggattatcattgaagttaatt
                                                                                                                                                                                                                                                                                                                                                                                                                       agagagcataaagatgtgcgtatagttattattgatagtgttactttccactttcgacaa
                                                                                                                                                                                                                                                                                                                                                                                                                                         agagagcataaagatgtgcgtatagttattattgatagtgttactttccactttcgacaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ttccggatatgcagttacaccgaacaaattgcagtcataaactacatggagaagttcctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ttccggatatgcagttacaccgaacaaattgcagtcataaactacatggagaagttcctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              aagtcctcttctgtccaaaaacaattacagcctgagcgtttcctggcggatatctattac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aagtcctcttctgtccaaaaacaattacagcctgagcgtttcctggcggatatctattac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           taccagattgctgaagggtgtattagggacatactggagcactttccgcacagccatgag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           taccagattgctgaagggtgtattagggacatactggagcactttccgcacagccatgag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggccttggtgggaaagcagtttatat....agagggcagtttcatggttgaacgtgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ggccttggtgggaaagcagtttatatagatacagagggcagtttcatggttgaacgtgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggtaaaactcaactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggtaaaactcaactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               atacttggtggcgggattcactgcaaagaagttactgagatcggtggcgtcccaggggtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             atacttggtggcgggattcactgcaaagaagttactgagatcggtggcgtcccaggggtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        atgttctctgatgagctgtcacagaaacacatcactactggttctggtgacctcaatgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         atgttctctgatgagctgtcacagaaacacatcactactggttctggtgacctcaatgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  totggctctagaaatggaccacaacagaagtacgtttcaggagcccagaatgcctgggat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tctggctctagaaatggaccacaacagaagtacgtttcaggagcccagaatgcctgggat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gttctcttcttcccccaatcagtaccacctctccaagtggcaatcaccatgggagatcaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gttctcttcttcccccaatcagtaccacctctccaagtggcaatcaccatgggagatcaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tgagaggtggaggtggctacaacgggtcggcggctgtgagatactgaaatccgcactgca
                                                                                                           tcacttccagtagcctcagccccgtatgcagtgacaggcaaagggattagagatg-tgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tgagaggtggaggtggctacaacgggtcggccggctgtgagatactgaaatccgcactgca
                                                                                                                                           1161
                                                 1073
                                                                                                           1013
                                                                                                                                                                                                                                                                    1041
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       441
                                                                                                                                                                           954
                                                                                                                                                                                                                                       894
                                                                                                                                                                                                                                                                                                    834
                                                                                                                                                                                                                                                                                                                               981
                                                                                                                                                                                                                                                                                                                                                             774
                                                                                                                                                                                                                                                                                                                                                                                          921
                                                                                                                                                                                                                                                                                                                                                                                                                                                      861
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
```

1;

```
RESULT
AAZ52425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                         adenocarcinoma and leukaemia; immune disorders such as AIDS, Addison's disease, diabetes mellitus, rheumatoid arthritis, multiple sclerosis, systemic lupus erythematosus, and myasthemia gravis; infections and trauma. Antagonists of the HTRM polypeptides are useful for treating or preventing disorders associated with increased expression or activity of HTRMs. HTRM polypeptides, their immunogenic fragments or oligopeptides are useful for screening libraries of compounds in drug screening the transcription of mRNA and regulating gene function by modulating the partitivity of mRNA and regulating gene function by modulating the partitivity of urbay vortices correcting urbay functions.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    05-MAY-1998;
07-AUG-1998;
02-OCT-1998;
           activity of HTRM. Vectors expressing HTRM or agonists can also be usprevent or treat disorder associated with decreased HTRM expression. Antibodies which specifically bind HTRM and polynucleotides encoding
                                                                                                                                                                                                      nucleotide sequences. The HTRM protein and nucleotide sequences are useful for preventing or treating disorders associated with decreased expression or activity of HTRM which include cell proliferative disorders such as arteriosclerosis and cirrhosis; cancers including
                                                                                                                                                                                                                                                                       AAZ52410-Z52474 are human transcriptional regulator molecule
                                                                                                                                                                                                                                                                                                       Claim 9; Page 156; 193pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                        Gerstin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HTRM; human transcriptional regulatory molecule; arteriosclerosis; AIDS; arteriosclerosis; cirrhosis; cancer; leukaemia; diabetes mellitus; ss; Addison's disease; multiple sclerosis; rheumatoid arthritis; infection; trauma; myasthenia gravis; adenocarcinoma; immune disorder; treatment.
                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 2000-052941/04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (INCY-) INCYTE PHARM INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    04-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WO9957144-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1074
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAZ52425 standard; DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24-FEB-2000
                                                                                                                                                                                                                                                                                                                                         peptides useful for diagnosis,
immune disorders -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccatcgtacattcagtaaagcctataatagcgggcatata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ccatcgtacattcagtaaagcctataatagcgggcaaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aagagagaagtaaatacaacagaacaggctaatatagtgttttgtatctgaacatctggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aagagagaagtaaatacaacagaacaggctaatatagtgttttgtatctgaacatctggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccactacgctcctgcagctttcttcgccatggatcttttggactagtgaggtgagactgg
     for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                       Patterson
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bandman O,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    98US-0084254.
98US-0095827.
98US-0102745.
   diagnosing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99WO-US09935
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                     Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1325
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lal P,
     disorders
                                                                                                                                                                                                                                                                                                                                                                                                                                     Baughn MR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Yue H,
                                                                                                                                                                                                                                                                                                                                                        prevention
associated with the exp
                                                                                                                                                                                                                                                                                                                                                                                                                                       Azimzai
                                                                                                                                                                                                                                                                                                                                                        and treatment of cancer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1441
                                                                                                                                                                                                                                                                                                                                                                                                                                     κ %
                                                                                                                                                                                                                                                                                                                                                                                                                                   Tang YT
 encoding HTRM
ression of
                                               used to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1401
```

RESULT AAF58252, ID AAF XX

AAF58252 standard; DNA;

936 BP

σ

```
Qγ
                                                                                                                                    멍
                                                                                                                                                                                                                                    Qy
   B
                                 QУ
                                                                   B
                                                                                                                                                                 Q
                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                            멍
                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches 408;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                    1049
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HTRM, particularly in assays that detect the expression of HTRM. Nucleotide sequences encoding HTRM may be useful to generate hybridization probes useful in mapping the naturally occurring gen sequence and to detect differences in gene sequences among normal, carrier and affected individuals. Using diagnostic assays, cancer detected prior to the appearance of clinical symptoms and thereby progression of cancer can be prevented by aggressive treatment or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 1325 BP; 399 A; 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       preventive measures.
                                                                     978
                                                                                                                                                                    989
                                                                                                                                                                                                                                       929
                                                                                                                                                                                                                                                                       798
                                                                                                                                                                                                                                                                                                         698
                                                                                                                                                                                                                                                                                                                                          738
                                                                                                                                                                                                                                                                                                                                                                                                            678
                                                                                                                                                                                                                                                                                                                                                                                                                                            749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             618
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
aggaatgcacagtactgtttcaaatcaaacctcagggatttagagatactgt
                               cagtagcctcagcaccgtatgcagtgacaggcaaagggattagagatgctgt 1160
                                                               tgattctgcactggaatgggaacgaacgatacgcacatcttgataagtctccttcacttc
                                                                                                                                                    ggtcatttcaattgactcttgctctaggtgacagctggtcccactcatgcacgaaccggt
                                                                                                                                                                                                caaataatcacagattagctgtaattttaaccaatcagatgacaacaaagattgatagaa
                                                                                                                                                                                                                      caaagacatataacttggcagttgtcttgttgaaccaagtcactactaaatttacagaag
                                                                                                                                                                                                                                                                  atgacctgtctcttcgtactcggttattaaatggcctagcccagcaaatgatcagccttg
                                                                                                                                                                                                                                                                                     aagatctggcactgaggaccagagtgctaagtggattatcattgaagttaatgaagattg
                                                                                                                                                                                                                                                                                                                                                            ataaagatgtgcgtatagttattgatagtgttactttccactttcgacaagattttg
                                                                                                                                                                                                                                                                                                                                                                                                                          tatgcagttacaccgaacaaattgcagtcataaactacatggagaagttcctcagagagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 atgagctgtcacagaaacacatcactactggttctggtgacctcaatgacatacttggtg
                                                                                                                                 atcaggccttgcttgttcctgcattaggggaaagttggggacatgctgctacaatacggc
                                                                                                                                                                                                                                                                                                                                     actcaaaggttcgactagtgatagtggatggtattgcttttccatttcgtcatgacctag
                                                                                                                                                                                                                                                                                                                                                                                                       gtcgtgactacacagagttactggcacaagtttatcttcttccagatttcctttcagaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cttctgtccaaaacaattacagcctgagcgtttcctggcggatatctattacttccgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ctgaagggtgtattagggacat---actggagcactttccgcacagccatgagaagtcct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gtgaagcagtttttattgatacagagggaagttttatggttgatagagtggtagaccttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggaaagcagtttatatatagatacagagggcagtttcatggttgaacgtgtctaccagattg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aattatgtatgcagttggcagtagatgtgcagataccagaatgttttggaggagtggcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggtggccttggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcgggattcactgcaaagaagttactgagatcggtggcgtcccaggggttggtaaaactc 511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aggagcatacccagggcttcataatcaccttctgttcagcactagatgatattcttgggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ctactgcctgcattcagcaccttcagcttatagcagaaaaacacaagggagaggaacacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gtggagtgcccttaatgaaaacaacagaaatttgtggtgcaccaggtgttggaaaaacac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12.1%; 52.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 178.4; DB 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C; 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ₽,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cancer can
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ω
•
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           genomic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                  1048
                                                                                                                                  977
                                                                                                                                                                                                  917
                                                                                                                                                                                                                                    988
                                                                                                                                                                                                                                                                    857
                                                                                                                                                                                                                                                                                                   928
                                                                                                                                                                                                                                                                                                                                       797
                                                                                                                                                                                                                                                                                                                                                                       868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         be
```

```
Qy
                                                                                                            Qy
                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                 Š
밁
                   δÃ
                                           В
                                                                                        밁
                                                                                                                                    밁
                                                                                                                                                          δõ
                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 8
                                                                                                                                                                                                                                                                                                                                                                                                               The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Electron-transfer group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Oligonucleotide D1835
                                                                  1026
                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Example 6; Page 127; 159pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               26-JUL-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene expression;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24-APR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAF58252;
                                                                                                                                                                                                                                                                                                                                                                                                       monitoring gene expression
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (CLIN-) CLINICAL MICRO SENSORS
                       1086
430
                                            490
                                                                                                               966
                                                                                                                                     610
                                                                                                                                                            906
                                                                                                                                                                                   670
                                                                                                                                                                                                        846
                                                                                                                                                                                                                               730
                                                                                                                                                                                                                                                      786
                                                                                                                                                                                                                                                                            790
                                                                                                                                                                                                                                                                                                   726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            single surface
                                                                                                                                                                                                                                                                                                                        Local Similarity
les 8; Conserv
                    tcttgataagtctccttcacttccagtagcctcagcaccgtatgcagtgacaggcaaagg 1145
                                                       tttccactttcgacaagattttgaagatctggcactgaggaccagagtgctaagtggatt 905
                                                                                                                                                                                                                               catggagaagttcctcagagagcataaagatgtgcgtatagttattattgatagtgttac 845
                                                                                                                                                                                                                                                                            ggcggatatctattacttccggatatgcagttacaccgaacaaattgcagtcataaacta 785
ишишишишишишишишишишишишишишиштаассишишишишишишишишиши 371
                                            agtcactactaaatttacagaagggtcatttcaattgactcttgctctaggtgacagctg 1025
                                                                                                                                     atcattgaagttaatgaagattgcaaagacatataacttggcagttgtcttgttgaacca 965
                                                                                                                                                                                  936 BP; 4 A; 139 C; 10 G; 7 T; 776 other;
                                                                                                                                                                                                                                                                                                                         Conservative 439;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              99US-0145695.
2000US-0190259.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SS
                                                                                                                                                                                                                                                                                                                                     1.1%;
                                                                                                                                                                                                                                                                                                                                               6.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ETM; mismatch; genotyping;
                                                                                                                                                                                                                                                                                                                                     Pred.
                                                                                                                                                                                                                                                                                                                                               Score 90.2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INC
                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                    e 90.2; DB 22;
No. 1e-13;
                                                                                                                                                                                                                                                                                                                          302;
                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                   936;
                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                         551
                                                                                                                                                                                                                                   671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                           0;
```

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QУ
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 6
AAF58254/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1146
                  The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping, monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                          gene expression;
                                                                                                                                                                                                                                                                                                                                                                                            Oligonucleotide D1875
                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAF58254 standard;
                                                                                                                               Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on
                                                                                                                                                                                                                                                                                          01-FEB-2001
                                                                                                                                                                                                                                                                                                                 WO200107665-A2
                                                                                                                                                                                                                                                                                                                                      Synthetic
                                                                                                                                                                                                                                                                                                                                                                      Electron-transfer
                                                                                                                                                                                                                                                                                                                                                                                                                 24-APR-2001 (first entry)
Sequence 936
                                                                                                  Example 6; Page 127; 159pp; English.
                                                                                                                                                                    WPI; 2001-159728/16
                                                                                                                                                                                         Umek RM
                                                                                                                                                                                                              (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                    26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                    26-JUL-2000; 2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  310
                                                                                                                       single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattcttggtg 1205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aaaaaaaaaaaaaaaaaaaaaaaaa 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gctaccaaccaaccttaagagagaagtaaatacaacagaacaggctaatatagtgttttg 1385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        agtgaggtgagactggagaatagtaccattttgttgattctcagttgctttgtgccgttg 1325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tcaagcacttgtatgtccactacgctcctgcagctttcttcgccatggatcttttggact 1265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2000US-0190259
BP; 4 A; 144 C; 7
                                                                                                                                                                                                                                                 99US-0145695
                                                                                                                                                                                                                                                                                                                                                             SS
                                                                                                                                                                                                                                                                                                                                                                      group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              936
                                                                                                                                                                                                                                                                                                                                                                        ETM; mismatch; genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ΒP
  <u>ი</u>
                                                                                                                                                                                                                 INC
  U
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    42
  Η,
   776 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    251
```

Query Match

Score 90.2;

В

Length 936;

```
RESULT 7
AAF58257/c
ID AAF582
XX AAF582
XX AAF582
XX DT 24-APR
DT 24-APR
DE Oligon
XX Electr
KW gene e
XX gene e
XX Synthe
XX Synthe
XX WO2001
XX
                                                                                                                                                                                           Q
                                                                                                                                                밁
                                                                                                                                                             δõ
                                                                                                                                                                             뫄
                                                                                                                                                                                                           В
                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                       뮹
                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                          ρy
                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Similarity
Matches 8; Conserv
        WO200107665-A2
                       Synthetic
                                     gene expression;
                                             Electron-transfer group; ETM; mismatch; genotyping;
                                                             Oligonucleotide D1954
                                                                            24-APR-2001
                                                                                            AAF58257;
                                                                                                          AAF58257 standard; DNA; 936
                                                                                                                                                            1446 aaaaaaaaaaaaaaaaaaaaaaaa 1474
                                                                                                                                                                                                                                                                                      1206
                                                                                                                                                                                                                                                                                                                    1146
                                                                                                                                                                                                                                                                       310
                                                                                                                                                                                                                                                                                                     370
                                                                                                                                                                                                                                                                                                                                                                 490
                                                                                                                                                                                                                                                                                                                                                                                                550
                                                                                                                                                                                                                                                                                                                                                                                                              966
                                                                                                                                                                                                                                                                                                                                                                                                                            610
                                                                                                                                                                                                                                                                                                                                                                                                                                           906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        730
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     726
                                                                                                                                                70
                                                                                                                                                                                                                                                tcaagcacttgtatgtccactacgctcctgcagctttcttcgccatggatctttttggact 1265
                                                                                                                                                                                                                                                                                                                 gattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattcttggtg
                                                                                                                                                                                                                                                                                                                                                               atcattgaagttaatgaagattgcaaagacatataacttggcagttgtcttgttgaacca 965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  catggagaagttcctcagagagcataaagatgtgcgtatagttattattgatagtgttac
                                                                                                                                                                            gctaccaaccaaccttaagagaagtaaatacaacagaacaggctaatatagtgttttg
                                                                                                                                                                                                                                       agtcactactacatttacagaagggtcatttcaattgactcttgctctaggtgacagctg 1025
                                                                                                                                                                                                                                                                                                                                                                                                                          tttccactttcgacaagattttgaagatctggcactgaggaccagagtgctaagtggatt 905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggcggatatctattacttccggatatgcagttacaccgaacaaattgcagtcataaacta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative 439;
                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1.1%; Pred. No. 1e-13;
                                                                                                          ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches 302;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                         1385
                                                                                                                                                                                                                                                                                                                                                1145
                                                                                                                                                                                                                                                                                                                                                               431
                                                                                                                                                                                                                                                                                                                                                                              1085
                                                                                                                                                                                                                                                                                                                                                                                                                           551
                                                                                                                                                                                                                                                                      251
                                                                                                                                                                                                                                                                                                                                                                                                                                                         611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                  Qγ
      В
                    Qy
                                    뫄
                                                                   밁
                                                                                δÃ
                                                                                                 밁
                                                                                                               οy
                                                                                                                               뫄
                                                                                                                                            QY
                                                                                                                                                             В
                                                                                                                                                                          δÃ
                                                                                                                                                                                           밁
                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                         Дb
                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                    뮍
                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 8
                                                                                                                                              1026
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   26-JUL-1999; 99US-0145695
17-MAR-2000; 2000US-0190259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           26-JUL-2000; 2000WO-US20476
                                                                                                 430
                                                                                                                                                             550
                                                                                                                                                                                          610
                                                                                                                                                                                                         906
                                                                                                                                                                                                                         670
                                                                                                                                                                                                                                       846
                                                                                                                                                                                                                                                       730
                                                                                                                                                                                                                                                                                    790
                                                                                                                                                                                                                                                                                                   726
                                                                                                                                                                                                                                                                                                                  Local Similarity es 8; Conser
```

```
The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (FTM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping, monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 936 BP; 5 A; 142 C; 7 G; 6 T; 776 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on a single surface -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Example 6; Page 127; 159pp; English.
agtgaggtgagactggagaatagtaccattttgttgattctcagttgctttgtgccgttg
                                                     tcaagcacttgtatgtccactacgctcctgcagctttcttcgccatggatcttttggact
                                                                                                                                                                                                                                                      gattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattcttggtg 1205
                                                                                                                                                                                                                                                                                                                                                  agtcactactaaatttacagaagggtcatttcaattgactcttgctctaggtgacagctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   atcattgaagttaatgaagattgcaaagacatataacttggcagttgtcttgttgaacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tttccactttcgacaagattttgaagatctggcactgaggaccagagtgctaagtggatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99099atatotattaottooggatatgoagttacacogaacaaattgoagtoataaacta 785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            catggagaagttcctcagagagcataaagatgtgcgtatagttattattgatagtgttac 845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6.1%; Score 90.2; DB 22; llarity 1.1%; Pred. No. 1e-13; Conservative 439; Mismatches 302;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                    1145
                                                                                                                                                                                                                                                                                                                                                                                                   1085
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1025
                                                   251
                                                                                                                                                    311
                                                                                                                                                                                                                                                                                                                                                     431
                                                                                                                                                                                                                                                                                                                                                                                                                                                    491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   551
```

밁

Qy Вb Qy

밁 Q

```
RESULT 8
AAF58259/c
                                                                                                                                                                Query Match
Best Local
                                                                                                                                                    Matches
                                                                                                                                                                                                                                                         The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping,
                                                                                                                                                                                                                                                                                                                                                                    Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on a single surface -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Electron-transfer group; ETM; mismatch; genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Oligonucleotide D2004.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAF58259 standard; DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1326 gctaccaaccaaccttaagagagaagtaaatacaacagaacaggctaatatagtgttttg 1385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene expression;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24-APR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAF58259;
                                                                                                                                                                                                                    Sequence 936 BP; 6 A; 138 C; 8 G; 8 T; 776 other;
                                                                                                                                                                                                                                                                                                                                             Example 6; Page 128; 159pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Umek RM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                26-JUL-2000;
                                                                                                                                                                                                                                               monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             846
                                          730
                                                                     786
                                                                                                790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
nes 8; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aaaaaaaaaaaaaaaaaaaaaaaaa 1474
catggagaagttcctcagagagcataaagatgtgcgtatagttattattgatagtgttac 845
                                                                                                                       ggcggatatctattacttccggatatgcagttacaccgaacaaattgcagtcataaacta 785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative 439;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2000US-0190259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      99US-0145695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SS
                                                                                                                                                                6.1%;
1.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  936
                                                                                                                                                                Score 90.2; DB 22;
Pred. No. 1e-13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INC
                                                                                                                                                     Mismatches
                                                                                                                                                     302;
                                                                                                                                                                             Length 936;
                                                                                                                                                     Indels
                                                                                                                                                     0;
                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
       RESULT 9
AAF58262/c
                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                                                                         AAF58262 standard; DNA; 936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1266 agtgaggtgagactggagaatagtaccattttgtttgattctcagttgctttgtgccgttg 1325
                                                                                                                                                                                                                        Synthetic
                                                                                                                                                                                                                                                                                         Oligonucleotide D2007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1446 aaaaaaaaaaaaaaaaaaaaaaaaaaa 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1206 tcaagcacttgtatgtccactacgctcctgcagctttcttcgccatggatcttttggact 1265
                  WPI; 2001-159728/16
                                             Umek RM;
                                                                                               26-JUL-1999; 99US-0145695.
17-MAR-2000; 2000US-0190259.
                                                                                                                                        26-JUL-2000; 2000WO-US20476
                                                                                                                                                                   01-FEB-2001
                                                                                                                                                                                              WO200107665-A2
                                                                                                                                                                                                                                                              Electron-transfer group;
                                                                                                                                                                                                                                                                                                                     24-APR-2001
                                                                                                                                                                                                                                                                                                                                                AAF58262;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            490
                                                                    (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          250
                                                                                                                                                                                                                                                                                                                                                                                                                                            tcttgataagtctccttcacttccagtagcctcagcaccgtatgcagtgacaggcaaagg 1145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          atcattgaagttaatgaagattgcaaagacatataacttggcagttgtcttgttgaacca 965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gctaccaaccaaccttaagagaagtaaatacaacagaacaggctaatatagtgttttg 1385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattcttggtg 1205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            agtcactactacatttacagaagggtcatttcaattgactcttgctctaggtgacagctg 1025
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ишшшшшшшшшшшшшшшшшшшшшштаассишшшшшишшшшшшшш 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     expression;
                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                 ETM;
                                                                                                                                                                                                                                                                                                                                                                           ВP
                                                                                                                                                                                                                                                                 mismatch;
```

71

251

Qγ

Вþ Q

Š В

```
δÃ
                                             밁
                                                                  δÃ
                                                                                           DЬ
밁
                                                                                                               Qy
                                                                                                                                          맑
                                                                                                                                                               δÃ
                                                                                                                                                                                         밁
                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SXXCCCCCXXXXPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                      1446
                                                                                                                                                                                                                   1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             monitoring gene expression
                                                                                                                                                                                                                                                                                        430
                                                                                                                                                                                                                                                                                                                                       490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Example 6; Page 128; 159pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nucleic acids containing electron-transfer group, useful as labels hybridization assays, e.g. for genotyping, allowing repeat analyses
                                                                                                                                                                                                                                                                                                                                                                                     550
                                                                                                                                                                                                                                                                                                                                                                                                                                                          906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       single-nucleotide polymorphisms, e.g. for genotyping,
                     aaaaaaaaaaaaaaaaaaaaaaa 1474
                                                                                          gctaccaaccaaccttaagagagaagtaaatacaacagaacaggctaatatagtgttttg 1385
                                                                                                                                        gattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattcttggtg
                                           agtgaggtgagactggagaatagtaccattttgttgattctcagttgctttgtgccgttg 1325
                                                                                                                                                                                       tcaagcacttgtatgtccactacgctcctgcagctttcttcgccatggatcttttggact 1265
                                                                                                                                                                                                                                                                                                         tcttgataagtctccttcacttccagtagcctcagcaccgtatgcagtgacaggcaaagg
                                                                                                                                                                                                                                                                                                                                                                                  atcattgaagttaatgaagattgcaaagacatataacttggcagttgtcttgttgaacca
                                                                 agtcactactaaatttacagaagggtcatttcaattgactcttgctctaggtgacagctg 1025
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggcggatatctattacttccggatatgcagttacaccgaacaaattgcagtcataaacta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tttccactttcgacaagattttgaagatctggcactgaggaccagagtgctaagtggatt.905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               catggagaagttcctcagagagcataaagatgtgcgtatagttattattgatagtgttac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
8; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        936 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5 A; 139 C; 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             439;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       G; 6 T; 776 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  90.2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       le-13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            302;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
                                                                                                                                                                                                                                                                                                            1145
                                                                  1445
                                                                                                                                        191
                                                                                                                                                                                                                                                                                                                                    431
                                                                                                                                                                                                                                                                                                                                                                                  491
                                                                                                                                                                                                                                                                                                                                                                                                                                                       965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
```

```
AAAF58255/c
ID AAF582
XX AAF582
AC Oligon
XX Electr
XX Gene 6
OS Synthe
XX WO2001
XX O1-FEE
YX WO2001
XX O1-FEE
YX Unek I
YX Unek I
YX Unek I
YX Unek I
YX Nucle:
PT hybric
PT hybric
YX Nucle:
PT hybric
YX Nucle:
PT hybric
YX Onek I
XX O
망
                                                ρ
                                                                                                          멍
                                                                                                                                                          Ω
                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                              DЪ
                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 938 BP; 4 A; 144 C; 9 G; 5 T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The present invention relates to a composition comprising
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Example 6; Page 127; 159pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene expression; ss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Electron-transfer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Oligonucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24-APR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAF58255 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26-JUL-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Synthetic.
                                                                                                                                                                                                                                                                                                                              670
                                                                                                                                                                                                                                                                                                                                                                                                                                          730
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                                                                                                                                                            atcattgaagttaatgaagattgcaaagacatataacttggcagttgtcttgttgaacca
ggcggatatctattacttccggatatgcagttacaccgaacaaattgcagtcataaacta 785
                                                                                                    agtcactactaaatttacagaagggtcatttcaattgactcttgctctaggtgacagctg 102:
                                                                                                                                                                                                                 tttccactttcgacaagattttgaagatctggcactgaggaccagagtgctaagtggatt 905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           catggagaagttcctcagagagcataaagatgtgcgtatagttattattgatagtgttac 845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative 439;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99US-0145695
2000US-0190259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         D1876
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ETM; mismatch; genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 90.2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        No. 1e-13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  776 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               302;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 938;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       two nucleic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                       491
                                                                                                                                                                                                                                                                    965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9
```

```
RESULT 1
AAF58252
1266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1146
                      The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1086 tettgataagteteetteaetteeagtageeteageaeegtatgeagtgaeaggeaaagg 1145
                                                                                                                                                                                    WPI;
                                                                                                                                                                                                                                                                                                                                                                                 Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                          gene expression;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Oligonucleotide D1835
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAF58252 standard;
           monitoring gene expression
                                                                                                    Example 6; Page 127; 159pp; English
                                                                                                                                        Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on
                                                                                                                                                                                                                                                                26-JUL-1999; 99US-0145695
17-MAR-2000; 2000US-0190259
                                                                                                                                                                                                                                                                                                       26-JUL-2000; 2000WO-US20476
                                                                                                                                                                                                                                                                                                                                01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                          WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                        Electron-transfer group; ETM; mismatch; genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           24-APR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAF58252;
                                                                                                                                                                                                                                      (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        250
                                                                                                                                single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agtgaggtgagactggagaatagtaccattttgttgattctcagttgctttgtgccgttg 1325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        toaagcacttgtatgtccactacgctcctgcagctttcttcgccatggatctttttggact 1265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aaaaaaaaaaaaaaaaaaaaaaaaa 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gctaccaaccaaccttaagagagaagtaaatacaacagaacaggctaatatagtgttttg 1385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattcttggtg
                                                                                                                                                                                    2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               42
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             251
```

QΥ

밁 Q 밁

멂 δõ Qy ₽

Дb

Ъ QΥ 밁 Qy

δÃ

```
RESULT
AAF58254
ID AAF
                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SO
Ş
                                                                                                                                                                                                       В
                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                           Ω<sub>V</sub>
                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 936 BP; 4 A; 139 C; 10 G; 7 T; 776 other;
      gene
                                                                                                                                                   1418
                                                                                                                                                                                                                                                                                                                                                                  1058
              Electron-transfer group;
                                 Oligonucleotide D1875
                                                   24-APR-2001
                                                                     AAF58254;
                                                                                      AAF58254 standard; DNA;
                                                                                                                                  729
                                                                                                                                                                                                                                         549
                                                                                                                                                                                                                                                                            489
                                                                                                                                                                                                                                                                                                                                                                                                                                       938
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              758
                                                                                                                                                                     669
                                                                                                                                                                                                                                                                                                                                                                                                                                                        189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9
                                                                                                                                                                                                                                                                                                                                                               actggaatgggaacgaacgatacgcacatcttgataagtctccttcacttccagtagcct 1117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          acaccgaacaaattgcagtcataaactacatggagaagttcctcagagagcataaagatg 817
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              aaaaacaattacagcctgagcgtttcctggcggatatctattacttccggatatgcagtt 757
                                                                                                                                                                                                                                                                                    ataacttggcagttgtcttgttgaaccaagtcactactaaatttacagaagggtcatttc 997

                                                                                                                                                                                                                                                                                                                                                                                                                                                               cactgaggaccagagtgctaagtggattatcattgaagttaatgaagattgcaaagacat 937
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tgcgtatagttattattgatagtgttactttccactttcgacaagattttgaagatctgg 877
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caacagaacaggctaatatagtgttttgtatctgaacatctggcccatcgtacattcagt 1417
                                                                                                                                                                                                                                                                                                                            cagcaccgtatgcagtgacaggcaaagggattagagatgctgtgagctcaaaccacaagc 1177
                                                                                                                                                                                                                                                                                                                                              aattgactcttgctctaggtgacagctggtcccactcatgcacgaaccggttgattctgc 1057
      expression;

                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative 454; Mismatches 316; Indels
                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6.1%;
                                                                                       936
                ETM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pred.
                                                                                       ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score
                 mismatch;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           89.8; DB 2
No. 1.3e-13
                 genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 936;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                    785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  68
                                                                                                                                                                                                         668
                                                                                                                                                                                                                                                                              548
                                                                                                                                                                                                                                                                                                                488
                                                                                                                                                                                                                                                                                                                                                   428
                                                                                                                                                                                                                                                                                                                                                                                      368
                                                                                                                                                                                                                                                                                                                                                                                                                                                           248
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
밁
                                                    δÃ
                                                                                                                  В
                                                                                                                                                                         Q
                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         26-JUL-2000; 2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 936 BP; 4 A; 144 C; 7 G; 5 T; 776 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Example 6; Page 127; 159pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (CLIN-) CLINICAL MICRO SENSORS INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 17-MAR-2000; 2000US-0190259.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  26-JUL-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   monitoring gene expression.
                                                                                                                                                                                                                                                                                                         1058
                                                    1178 gagcccgagtaacgtagcattcttggtgtcaagcacttgtatgtccactacgctcctgca 1237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                938 ataacttggcagttgtcttgttgaaccaagtcactactaaatttacagaagggtcatttc 997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        758 acaccgaacaaattgcagtcataaactacatggagaagttcctcagagagcataaagatg 817
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    698 aaaaacaattacagcctgagcgtttcctggcggatatctattacttccggatatgcagtt 757
                                                                                                                                                                                                                                              369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9 жүүн байуу байуу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tgcgtatagttattattgatagtgttactttccactttcgacaagattttgaagatctgg 877
                                                                                                                                                                                                                                                                                               actggaatgggaacgaacgatacgcacatcttgataagtctccttcacttccagtagcct 1117
                                                                                                                                                                                                                                                                                                                                                                                                                           aattgactcttgctctaggtgacagctggtcccactcatgcacgaaccggttgattctgc 1057
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cactgaggaccagagtgctaagtggattatcattgaagttaatgaagattgcaaagacat 937
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cagcaccgtatgcagtgacaggcaaagggattagagatgctgtgagctcaaaccacaagc 1177
                                                                                                                                                                                                                                                                                                                                                                   Conservative 454; Mismatches 316;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     99US-0145695.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 89.8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1.3e-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 936;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   XX
SO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 13
AAF58257
                                                                                                                                                       Qy
                                      밁
                                                            Qy
                                                                                                               Query Match
                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gene expression;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Oligonucleotide D1954.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAF58257 standard; DNA; 936 BP
                                                                                                                                                                                         acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Electron-transfer group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          24-APR-2001 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAF58257;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 936 BP; 5 A; 142 C; 7 G; 6 T; 776 other;
                                                                                                                                                                                                                                             The present invention relates to a composition comprising two nucleic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     26-JUL-2000; 2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Example 6; Page 127; 159pp; English.
                                                                                                                                                                                                                                                                                                a single surface
                                                                                                                                                                                                                                                                                                           Nucleic acids containing electron-transfer group, useful as labels i
hybridization assays, e.g. for genotyping, allowing repeat analyses
                                                                                                                                                                                                                                                                                                                                                    WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                              Umek RM
                                                                                                                                                                                                                                                                                                                                                                                                                                17-MAR-2000; 2000US-0190259
                                                                                                                                                                                                                                                                                                                                                                                                                                            26-JUL-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                      (CLIN-) CLINICAL MICRO SENSORS INC
                                                            698 aaaaacaattacagcctgagcgtttcctggcggatatctattacttccggatatgcagtt 757
758 acaccgaactaaattgcagtcataaactacatggagaagttcctcagagagcataaagatg 817
                                                                                                  Match 6.1%;
Local Similarity 0.9%; F
                                     caacagaacaggctaatatagtgttttgtatctgaacatctggcccatcgtacattcagt 1417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative 454;
                                                                                                                                                                                                                                                                                                                                                                                                                                              99US-0145695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ETM; mismatch; genotyping;
                                                                                                     Score 89.8; DB Pred. No. 1.3e-13
                                                                                          Mismatches
                                                                                                                   DB 22; Length 936;
                                                                                             316;
                                                                                             Indels
                                                                                             0;
                                                                                             Gaps
                                                                                              0
```

```
RESULT 14
AAF58259
ID AAF582
XX AAF582
XX AF582
XX D1 24-APR
XX Clectr
KW Gene e
XX Synthe
XX W02001
XX W02001
XX F1 C-JUL
XX AF582
PF 26-JUL
XX AF582
PF 26-JUL
XX AF582
PA (CLIN-
XX AAF582
IT MAF
XX AF582
PA (CLIN-
XX AF582
IT MAF
XX AF5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                     26-JUL-1999; 99US-0145695, 17-MAR-2000; 2000US-0190259
                     (CLIN-) CLINICAL MICRO SENSORS INC
                                                                                                                                                  26-JUL-2000; 2000WO-US20476
                                                                                                                                                                                                        01-FEB-2001
                                                                                                                                                                                                                                                             WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                             gene expression; ss
                                                                                                                                                                                                                                                                                                                                                                                                                                      Oligonucleotide D2004
                                                                                                                                                                                                                                                                                                                                                                                Electron-transfer group; ETM; mismatch; genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      24-APR-2001 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAF58259;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAF58259 standard; DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          938
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          878
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                818
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           caacagaacaggctaatatagtgttttgtatctgaacatctggcccatcgtacattcagt 1417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gagcccgagtaacgtagcattcttggtgtcaagcacttgtatgtccactacgctcctgca 1237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cagcaccgtatgcagtgacaggcaaagggattagagatgctgtgagctcaaaccaccacgc 1177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aattgactcttgctctaggtgacagctggtcccactcatgcacgaaccggttgattctgc 1057
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ataacttggcagttgtcttgttgaaccaagtcactactaaatttacagaagggtcatttc 997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             <u> 248</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tgcgtatagttattattgatagtgttactttccactttcgacaagattttgaagatctgg 877
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         548
```

```
Qy
                                  밁
                                                                                       DЬ
                                                                                                                Qy
                                                                                                                                              Дb
                                                                                                                                                                       QΥ
                                                                                                                                                                                                     B
                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                   δã
                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping, monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 936 BP; 6 A; 138 C; 8 G; 8 T; 776 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on a single surface
                                                                                                                                                                                                     489
                                                                                                                                                                                                                                                         429
                                                                                                                                                                                                                                                                                                              369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        878
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Example 6; Page 128; 159pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 2001-159728/16.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Umek RM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            698 aaaaacaattacagcctgagcgtttcctggcggatatctattacttccggatatgcagtt 757
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        758 acaccgaacaaattgcagtcataaactacatggagaagttcctcagagagcataaagatg 817
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6.1%;
Local Similarity 0.9%;
hes 7; Conservation ...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caacagaacaggctaatatagtgttttgtatctgaacatctggcccatcgtacattcagt 1417

                                                                                                                                                               gagcccgagtaacgtagcattcttggtgtcaagcacttgtatgtccactacgctcctgca 1237
                                                                                                                                                                                                                                                    cagcaccgtatgcagtgacaggcaaagggattagagatgctgtgagctcaaaccacaagc 1177
                                                                                                                                                                                               actggaatgggaacgatacgcacatcttgataagtctccttcacttccagtagcct 1117
                                                                                                                                                                                                                                                                                                                                                              aattgactcttgctctaggtgacagctggtcccactcatgcacgaaccggttgattctgc 1057
                                                                                                                                                                                                                                                                                                                                                                                                                                           ataacttggcagttgtcttgttgaaccaagtcactactaaatttacagaagggtcatttc 997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cactgaggaccagagtgctaagtggattatcattgaagttaatgaagattgcaaagacat 937
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tgcgtatagttattattgatagtgttactttccactttcgacaagattttgaagatctgg 877
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative 454; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 89.8; DB 22;
Pred. No. 1.3e-13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           316;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 936;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                  899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        248
                                                                                                                                        809
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
```

```
밁
                     ρy
                                                 밁
                                                                       Ω
                                                                                                   Дb
                                                                                                                          Q
                                                                                                                                                    밁
                                                                                                                                                                            Qy
                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                         RESULT 15
AAF58262
                                                                                                                                                                                                                           QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                         The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on
                                                                                                                                                                                                                                                                                                                        Sequence 936 BP; 5 A; 139 C; 10 G; 6 T; 776 other;
                                                                                                                                                                                                                                                                                                                                                and single-nucleotide polymorphisms, e.g. for genotyping monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                         Example 6; Page 128; 159pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 2001-159728/16.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               26-JUL-1999; 99US-0145695.
17-MAR-2000; 2000US-0190259.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-FEB-2001.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene expression; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Electron-transfer group; ETM; mismatch; genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Oligonucleotide D2007.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         24-APR-2001 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (CLIN-) CLINICAL MICRO SENSORS INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAF58262 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     26-JUL-2000; 2000WO-US20476
  249
                     938 ataacttggcagttgtcttgttgaaccaagtcactactacaatttacagaagggtcatttc 997
                                                                                                  818
                                                                                                                                                                                                                  698 aaaaacaattacagcctgagcgtttcctggcggatatctattacttccggatatgcagtt 757
                                                                                                                                                                            758 acaccgaacaaattgcagtcataaactacatggagaagttcctcagagagcataaagatg 817
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            single surface
                                                                                                                                                    Local Similarity les 7; Conserv
                                                                                                                                                                                                      tgcgtatagttattattgatagtgttactttccactttcgacaagattttgaagatctgg 877
                                                                                                                                                                                                                                                       6.1%; Score 89.8; DB 22; Length ilarity 0.9%; Pred. No. 1.3e-13; Conservative 454; Mismatches 316; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ВP
                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                      Gaps
                                                248
                                                                                                                                                                                                                                                       0;
```

```
밁
          γΩ
                      밁
                                Qy
                                            В
                                                       ρy
                                                                    В
                                                                              δÃ
                                                                                            맖
                                                                                                      QΥ
                                                                                                                  DЬ
                                                                                                                             δÃ
                                                                                                                                          Ъ
                                                                                                                                                    Ω
                                                                                                                                                                 Вb
                                                                                                                                                                           ρy
                                                                                                       1178
                                                                                                                                        429
                                                                   998 aattgactcttgctctaggtgacagctggtcccactcatgcacgaaccggttgattctgc 1057
         gagcccgagtaacgtagcattcttggtgtcaagcacttgtatgtccactacgctcctgca
                                                                                                                  cagcaccgtatgcagtgacaggcaaagggattagagatgctgtgagctcaaaccacaagc 1177
ч
                                                                              809
                                                                                           548
```

Search completed: October 2, 2001, 05:51:15 Job time: 3021 sec

Run

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Database :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             on:
       Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    d. No. is the number of results predicted by chance to have a
re greater than or equal to the score of the result being printed,
is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Issued_Patents_AA:*

1: /cgn2_6/ptodata/2,

2: /cgn2_6/ptodata/2,

3: /cgn2_6/ptodata/2,

4: /cgn2_6/ptodata/2,

5: /cgn2_6/ptodata/2,

6: /cgn2_6/ptodata/2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query
     Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-537-654-2
1530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          197339 seqs, 20590346 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           October 1, 2001, 16:27:27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MGDQSGSRNGPQQKYVSGAQ.....VTGKGIRDAVSSNHKRARVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/BCTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                     В
US-09-157-603-1
US-09-587-436-3
US-09-587-436-3
US-09-587-436-3
US-08-758-280-2
US-08-758-280-2
US-08-964-614A-1
US-08-964-614A-1
US-08-964-614A-1
US-08-964-614A-1
US-08-444-189-8
US-08-444-189-8
US-08-444-189-8
US-08-444-920-2
US-08-261-110A-4
US-08-261-110A-4
US-08-261-110A-4
US-08-261-110A-2
US-08-97-831-2
US-08-98-96-327-3
US-08-98-310-912A-109
PCT-US95-04589-109
US-08-680-327-3
US-08-680-327-3
US-08-680-327-3
US-08-680-327-3
US-08-684-699A-2
US-08-968-699A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Search time 12.27 Seconds (without alignments) 493.363 Million cell updates/sec
                  sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Description
   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
e 1, Appli
e 3, Appli
e 3, Appli
e 3, Appli
e 2, Appli
e 1, Appli
e 1, Appli
e 2, Appli
e 2, Appli
e 2, Appli
e 3, Appli
e 4, Appli
e 10, Appli
e 10,
```

Qy 236 GDSWSHSCTNRLILHWNGNERYAHL-DKSPSLPVASAPYAVTGKGI  ::          : :             : : : Db 297 GNTWSHSVNTRLILQYLDSERRQILIAKSPLAPETSFVYTIKEEGL	QY 198 GLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSPQLTLAL ;   ;  ;  ;         ;   ;   ;   ;   ;	QY 143 YYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFEDLALRTRVLS	QY 87 GGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFL-ADI	QY 27 SDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGL   :	Query Match 21.1%; Score 323; DB 4; Leng Best Local Similarity 32.2%; Pred. No. 1.6e-29; Matches 92; Conservative 44; Mismatches 100; In	RESULT 1  US-09-157-603-1  US-09-157-603-1  J Sequence 1, Application US/09157603  Sequence 1, Application US/09157603  Patent No. 6174694  GENERAL INFORMATION:  APPLICANT: Havre, Pamela A.  APPLICANT: RICe, Michael C.  APPLICANT: Kniec, Eric B.  TITLE OF INVENTION: REC2 Kinase  FILE REFERENCE: 7991-034-999  CURRENT APPLICATION NUMBER: US/09/157,603  CURRENT FILING DATE: 1998-09-21  NUMBER OF SEQ ID NOS: 8  SOFTWARE: FastSEQ for Windows Version 3.0  SEQ ID NO 1  LENGTH: 350  TYPE: PRT  ORGANISM: Homo Sapiens	ALIGNMENTS	28 84 5.5 2713 5 PCT-US96-01735-1 29 81.5 5.3 426 2 US-08-644-034A-3 30 78.5 5.1 186 1 US-08-29-672-3 31 78.5 5.1 186 1 US-08-29-672-3 32 78.5 5.1 186 1 US-08-459-351-3 33 78.5 5.1 186 1 US-08-460-533-3 34 78.5 5.1 186 5 PCT-US94-06654-3 35 78.5 5.1 189 3 US-09-209-6654-3 36 78.5 5.1 189 3 US-09-356-952-1 37 78 5.1 189 3 US-09-356-952-1 38 76 5.1 189 3 US-08-472-172-2 38 76 5.1 459 2 US-08-472-172-2 39 74.5 4.9 189 2 US-08-429-944-82 40 74 4.8 390 1 US-08-147-118A-6 42 74 4.8 390 1 US-08-477-118A-6 43 74 4.8 390 5 PCT-US93-08322-6 45 74 4.8 390 1 US-08-565-386-16
;KGI 280 : : :EGL 342	TEGSFQLTLAL 235	FEDLALRTRVLS 197 	HSHEKSSSVQKOLOPERFL-ADI 142 ::	GIQLAINVQIPVECGGL 86   ::  :        CIMMSILATLPTNMGGL 134	Length 350; Indels 50; Gaps			Sequence 1, Appli Sequence 3, Appli Sequence 3, Appli Sequence 3, Appli Sequence 3, Appli Sequence 3, Appli Sequence 1, Appli Sequence 1, Appli Sequence 2, Appli Sequence 2, Appli Sequence 82, Appli Sequence 6, Appli

7;

; Sequence 1, Application US/09587436

RESULT 2 US-09-587-436-1

```
; TYPE: PRT; ORGANISM: Homo Sapiens US-09-587-436-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-157-603-3
                                                                                                                                                us-09-157-603-3
                                                                                                                                                                                        SEQ ID NO 3
LENGTH: 350
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: F
SEQ ID NO 1
LENGTH: 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 3, Application US/09157603 Patent No. 6174694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Patent No. 6210916
GENERAL INFORMATION
                                                             Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                       APPLICANT: Havre, Pamela A.
APPLICANT: RICe, Michael C.
APPLICANT: Holloman, William K.
APPLICANT: Kmiec, Eric B.
TITLE OF INVENTION: REC2 Kinase
FILE REFERENCE: 7991-034-999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CURRENT APPLICATION NUMBER: US/09/587,436
CURRENT FILING DATE: 2000-06-05
PRIOR APPLICATION NUMBER: 09/157,603
PRIOR APPLICATION NUMBER: 1998-09-21
NUMBER OF SEQ ID NOS: 8
SOFTWARE: FastSEQ for Windows Version 3.
                                                                                                                                                                                                                                                   CURRENT APPLICATION NUMBER: US/09/157,603
CURRENT FILING DATE: 1998-09-21
NUMBER OF SEQ ID NOS: 8
SOFTWARE: FastSEQ for Windows Version 3.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE OF INVENTION: FILE REFERENCE: 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                  ORGANISM: Mus Musculus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        135 EGAVVYIDTESAFSAERLVEIAE-----SRFPRYFNTEEKLLLTSSKVHLYRELTCDE 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        236 GDSWSHSCTNRLILHWNGNERYAHL-DKSPSLPVASAPYAVTGKGI 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      237 REASSLKYLAEEFSIPVILTNQITTHLSGALASQADLVSPADDLSLSEGTSGSSCVIAAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     188 VLQRIESLEEEII------SKGIKLVILDSVASVVRKEFDAQLQGNLKERNKFLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               143 YYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE-----DLALRTRVLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     297 GNTWSHSVNTRLILQYLDSERRQILIAKSPLAPFTSFVYTIKEEGL 342
20 QNAWDM---FSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAIN 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                87 GGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP---HSHEKSSSVQKQLQPERFL-ADI 142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                27 SDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGL 86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GLSLKLMKIAKTYNLAVVLLNQVTTKF------TEGSFQLTLAL 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SADFSPAFLSTTLSALDEALHGGVACGSLTEITGPPGCGKTQFCIMMSILATLPTNMGGL 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INFORMATION:
                                           100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Kmiec, Eric B.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RICe, Michael C.
Holloman, William K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Havre, Pamela
                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7991-034-999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REC2 Kinase
                                       20.5%; Score 313; DB 4; I
32.1%; Pred. No. 2.4e-28;
tive 46; Mismatches 98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               21.1%; score 323; DB 4; Length 350; 32.2%; Pred. No. 1.6e-29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .
                                                                                 DB 4; Length 350;
                                         Indels 68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           50;
                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               197
                                           13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7;
Qy
                                           В
                                                                            Qy
                                                                                                                          B
                                                                                                                                                                  δÃ
                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                        QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; LENGTH: 350
; TYPE: PRT
; ORGANISM: Mus Musculus
US-09-587-436-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-587-436-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOFTWARE: ra.
SEQ ID NO 3
FORGTH: 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 3, Application US/09587436 Patent No. 6210916
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 100; Conserva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: Kmiec, Eric B.
TITLE OF INVENTION: REC2 Kinase
FILE REFERENCE: 7991-034-999
CURRENT APPLICATION NUMBER: US/09/587,436
CURRENT FILING DATE: 2000-06-05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRIOR APPLICATION NUMBER:
                                           281
                                                                                                                             222
                                                                                                                                                                      188
                                                                                                                                                                                                              178
                                                                                                                                                                                                                                                        130 Q--KQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE 187
                                                                                                                                                                                                                                                                                                 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       341 GL---VLQGHER 349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  130 Q--KQLOPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            125 ATLPTSLGGLEGAVVYIDTESAFTAERLVEIAE-----SRFPQYFNTEEKLLLTSSRV 177
                                                                                   225
                                                                                                                                                                                                                                                                                                                                           77
                                                                                                                                                                                                                                                                                                                                                                                   65
                                                                                                                                                                                                                                                                                                                                                                                                        20 QNAWDM---FSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAIN 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GIRDAVSSNHKR 290
                                         SLSEGTSGSSCLVAALGNTWGHCVNTRLILQYLDSERRQILIAKSPLAAFTSFVYTIKGE 340
                                                                                                                             PKLQGNIKERNKFLGKGASL-LKYLAGEFSIPVILTNQITTHLSGALPSQADLVSPADDL 280
                                                                                                                                                                                                              HLCRELTCEGLLQ-----RLESLEEEII-----SKGVKLVIVDSIASVVRKEFD
                                                                                                                                                                                                                                                                                                 ATLPTSLGGLEGAVVYIDTESAFTAERLVEIAE-----SRFPQYFNTEEKLLLTSSRV 177
                                                                                                                                                                                                                                                                                                                                         VQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP---HSHEK----SSSV 129
                                                                                                                                                                                                                                                                                                                                                                                   QTAYELKTRRSAHLSPAFLSTTLCALDEALHGGVPCGSLTEITGPPGCGKTQFCIMMSVL 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GIRDAVSSNHKR 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SLSEGTSGSSCLVAALGNTWGHCVNTRLILQYLDSERRQILIAKSPLAAFTSFVYTIKGE 340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PKLQGNIKERNKFLGKGASL-LKYLAGEFSIPVILTNQITTHLSGALPSQADLVSPADDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----DLALRTRVL-SGLSLKLMKIAKTYNLAVVLLNQVTTKF-----------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HLCRELTCEGLLQ-----RLESLEEEII---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFP---HSHEK----SSSV 129
                                                                               ----TEGSFQLTLALGDSWSHSCTNRLILHWNGNERYAHL-DKSPSLPVASAPYAVTGK 278
                                                                                                                                                                    ----DLALRTRVL-SGLSLKLMKTAKTYNLAVVLLNQVTTKF----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----TEGSFQLTLALGDSWSHSCTNRLILHWNGNERYAHL-DKSPSLPVASAPYAVTGK 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FastSEQ for Windows Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RICe, Michael C.
Holloman, William K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Havre, Pamela A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20.5%; Score 313; DB 4; Length 350 32.1%; Pred. No. 2.4e-28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      46; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1998-09-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             09/157,603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----SKGVKLVIVDSIASVVRKEFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      68;
```

Gaps

13;

224 221 Ş В Qy 밁 20 밁 Qy

198

멍

Ş

Matches

밁

δÃ

Best Loca Matches

В

315 YDSPCLPEAEAMFAINADGVGDA 337

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-08-758-280-2
                                                                                           Ωy
                                                                                                                                    Вb
                                                                                                                                                                         γΩ
                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                            В
                  δÃ
                                                                                                                                                                                                                                                                                                                              QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-08-758-280-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 2, Application US/08758280 Patent No. 6037125
                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELEX: 66141
INFORMATION FOR SEQ ID NO: 2:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION: I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM FC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION UNIMEER. ID-018/758 380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECULE TYPE: pr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELECOMMUNICATION INFORMATION:
TELEPHONE: (415) 854-3660
TELEFAX: (415) 854-3694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS:
ADDRESSEE: PENNIE & EDMONDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ANTI-SENSE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              341 GL---VLQGHER 349
                  261 DKSPSLPVASAPYAVTGKGIRDA 283
                                                                                                                                                                           150
                                                                                                                                                                                                                  162 TEGTFRPERLLAVAERYGLSG--SDVLDNVAYARAFNTDHQTQLL-------
                                                                                                                                                                                                                                                                                            102 ITTGSKELDKLLQGGIETGSITEMFGEFRTGKTQICHTLAVTCQLPIDRGGGEGKAMYID 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CITY: New York
                                                                                                                                                                                                                                                                                                                                  35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NAME: Halluin, Albert P.
REGISTRATION NUMBER: 25,227
REFERENCE/DOCKET NUMBER: 8535-013-999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: US/08/758,280 FILING DATE: concurrently herewith
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STREET:
                                                                                                                                                                                                                                                       95 TEGSFMVERVYQIAE-----GCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICS 149
                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LENGTH:
                                                                                           AKTYNLAVVLLNQVTTKFTEGSFQLTL----ALGDSWSHSCTNRLILH-WNGNERYAHL 260
                                                                                                                                                                           YTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLMKI 206
                                                                                                                                                                                                                                                                                                                TTTGSGDLNDILGGGIHCKEVTEIGGVÞGVGKTQLGIQLAINVQIPVECGGLGGKAVYID 94
                                                         ADEFGVAVVITNOVVAQ-VDGAAMFAADPKKPIGGNIIAHASTTRLYLRKGRGETRICKI 314
                                                                                                                                    ······YQASAMMVESRYALLIVDSATALYRTDYSGRGELSARQMHLARFLRMLLRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    10036-2711
                                                                                                                                                                                                                                                                                                                                                                         ;08
= = = ::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ΥN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        339 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1155 Avenue of the Americas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hasty, Paul
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NO
                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             concurrently herewith
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 not relevant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DISRUPTION OF THE MAMMALIAN Rad51
PROTEIN AND DISRUPTION OF PROTEINS THAT ASSOCIATE WITH MAMMALIAN RAd51 FOR HINDERING CELL PROLIFERATION AND/OR VIABILITY OF PROLIFERATING CELLS
                                                                                                                                                                                                                                                                                                                                                                                      18.4%; Score 281.5; DB 3 30.4%; Pred. No. 1.2e-24;
                                                                                                                                                                                                                                                                                                                                                                         46;
                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                            DB 3; Length 339;
                                                                                                                                                                                                                                                                                                                                                                         96;
                                                                                                                                                                                                                                                                                                                                                                         Indels 41;
                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                        255
                                                                                                                                                                                                                    204
                                                                                                                                                                                                                                                                                                                                                                         7;
```

```
US-08-964-614A-2
                                Qy
                                                                                                      γ
                                                                                                                                              밁
                                                                                                                                                                               Qy
                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                             맑
                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-08-964-614A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 2, Application US/08964614A Patent No. 6057104
                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION: APPLICANT: Hasty,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER READABLE FORM:
MEDIUM TYPE: Diskett
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES: 4
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS LENGTH: 339 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TELECOMMUNICATION INFORMATION:
TELEPHONE: 650-493-4935
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTORNEY/AGENT INFORMATION: NAME: Coruzzi, Laura A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FILING DATE: 05-NOV-CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MOLECULE TYPE:
315 YDSPCLPEAEAMFAINADGVGDA 337
                                                                         256
                                                                                                           207
                                                                                                                                                                                                                                                                                             102 ITTGSKELDKLLQGGIETGSITEMFGEFRTGKTQICHTLAVTCQLPIDRGGGEGKAMYID 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER: IBM CON
OPERATING SYSTEM:
SOFTWARE: FastSEC
                                    261 DKSPSLPVASAPYAVTGKGIRDA 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEPHONE: 650-493-5556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REGISTRATION NUMBER: 30, REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US 0 FILING DATE: 05-NOV-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICATION NUMBER: US/08/964,614A FILING DATE: 05-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CITY: New York
                                                                                                                                                                                                                                                      95 TEGSFMVERVYQIAE-----GCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICS 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE:
                                                                                                                                                                                                                                                                                                                               35 ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE:
                                                                                                                                                                               YTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLMKI 206
                                                                                                        AKTYNLAVVLLNQVTTKFTEGSFQLTL-----ALGDSWSHSCTNRLILH-WNGNERYAHL 260
                                                                     ADEFGVAVVITNOVVAQ-VDGAAMFAADPKKPIGGNIIAHASTTRLYLRKGRGETRICKI 314
                                                                                                                                                                                                                       TEGTFRPERLLAVAERYGLSG--SDVLDNVAYARAFNTDHQTQLL-------
                                                                                                                                                                                                                                                                                                                                                                      80;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10036-2811
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ΝY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1155 Avenue of the Americas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     339 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hasty, Paul
                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SYSTEM: Windows FastSEQ for Windows Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IBM Compatible
                                                                                                                                              -YQASAMMVESRYALLIVDSATALYRTDYSGRGELSARQMHLARFLRMLLRL 255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pennie & Edmonds, LLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  No. 6057104e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DISRUPTION OF THE MAMMALIAN RAG51 PROTEIN AND DISRUPTION OF PROTEINS THAT ASSOCIATE WITH MAMMALIAN RAG51 FOR HINDERING CELL PROLIFERATION
                                                                                                                                                                                                                                                                                                                                                                                     18.4%; Score 281.5; DB 3 30.4%; Pred. No. 1.2e-24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             us 08/758,280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  30,742
                                                                                                                                                                                                                                                                                                                                                                        46; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8535-0019-999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2.0b
                                                                                                                                                                                                                                                                                                                                                                                                        DB 3;
                                                                                                                                                                                                                                                                                                                                                                        96;
                                                                                                                                                                                                                                                                                                                                                                        Indels 41;
                                                                                                                                                                                                                                                                                                                                                                                                      Length 339;
                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                           204
```

7;

```
밁
                                  οy
                                                                           밁
                                                                                                         οy
                                                                                                                                                Бр
                                                                                                                                                                                   QΨ
                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                 멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; ANTI-SENSE: NO
US-08-758-280-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 7
US-08-758-280-1
                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Patent No. 6037125
GENERAL INFORMATION:
APPLICANT: Hastv no. 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INFORMATION FOR SEQ ID NO: 1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOLECULE TYPE:
HYPOTHETICAL:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REGISTRATION NUMBER: 25,227
REFERENCE/DOCKET NUMBER: 8535-013-999
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE OF INVENTION: MA
TITLE OF INVENTION: VI.
NUMBER OF SEQUENCES: 2
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION:
315 YDSPCLPEAEAMFAINADGVGDA 337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STREET: 11.
                                  261 DKSPSLPVASAPYAVTGKGIRDA 283
                                                                                                                                                    205
                                                                                                                                                                             150 YTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLMKI 206
                                                                                                                                                                                                                                                                                         102 ITTGSKELDKLLQGGIETGSITEMFGEFRTGKTQICHTLAVTCQLPIDRGGGEGKAMYID 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEFAX: (***
TELEFAX: 66141
                                                                                                                                                                                                                     162 TEGTFRPERLLAVAERYGLSG--SDVLDNVAYARGFNTDHQTQLL-------
                                                                                                                                                                                                                                                    95 TEGSFMVERVYQIAE-----GCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICS 149
                                                                                                                                                                                                                                                                                                                             35 ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                     Match 18.3%; Score 280.5; DB 3 Local Similarity 30.4%; Pred. No. 1.5e-24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER: US/08/758,280 FILING DATE: concurrently herewitl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                     ADEFGVAVVITNQVVAQ-VDGAAMFAADPKKPIGGNIIAHASTTRLYLRKGRGETRICKI 314
                                                                                                         AKTYNLAVVLLNQVTTKFTEGSFQLTL-----ALGDSWSHSCTNRLILH-WNGNERYAHL 260
                                                                                                                                                                                                                                                                                                                                                                        8O;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RY: USA
10036-2711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Halluin, Albert P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      339 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1155 Avenue of the Americas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (415) 854-3694
                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      linear
                                                                                                                                            -YQASAMMVESRYALLIVDSATALYRTDYSGRGELSARQMHLARFLRMLLRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (415) 854-3660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PENNIE & EDMONDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              concurrently herewith
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     not relevant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DISRUPTION OF THE MAMMALIAN RAd51
PROTEIN AND DISRUPTION OF PROTEINS THAT ASSOCIATE WITH
MAMMALIAN RAd51 FOR HINDERING CELL PROLIFERATION AND/OR
VIABILITY OF PROLIFERATING CELLS
                                                                                                                                                                                                                                                                                                                                                                      46;
                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                       DB 3;
                                                                                                                                                                                                                                                                                                                                                                      96;
                                                                                                                                                                                                                                                                                                                                                                  Indels 41; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                     Length 339;
                                                                                                                                              255
                                                                                                                                                                                                                                                                                                                                                                  7;
```

```
Qy
                                                                                                                                                밁
                                                                         밁
                                                                                                                                                                                 Qy
                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-08-964-614A-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-08-964-614A-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 1, Application US/08964614A Patent No. 6057104
                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: Hasty, Paul
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY: 1; MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELECOMMUNICATION INFORMATION: TELEPHONE: 650-493-4935
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/758,280
FILING DATE: 05-NOV-1996
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ZIP: 10036-2811
COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Hasty, Paul
TITLE OF INVENTION: DISRUPTION OF THE MAMMALIAN
TITLE OF INVENTION: Rad51 PROTEIN AND DISRUPTION OF PROTEINS THAT ASSOCIATE
TITLE OF INVENTION: WITH MAMMALIAN Rad51 FOR HINDERING CELL PROLIFERATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOFTWARE: FastSEQ for Windows Version CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CORRESPONDENCE ADDRESS:
                                                                                                           207
                                                                                                                                                                                                                     162 TEGTFRPERLLAVAERYGLSG--SDVLDNVAYARGFNTDHQTQLL----
                                                                                                                                                                                                                                                                                             102 ITTGSKELDKLLQGGIETGSITEMFGEFRTGKTQICHTLAVTCQLPIDRGGGEGKAMYID 161
                                                                                                                                                                               150 YTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLMKI 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: FILING DATE: 05-NOV CLASSIFICATION: 435
                                                                                                                                                                                                                                                        95 TEGSFMVERVYQIAE-----GCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICS 149
                                                                                                                                                                                                                                                                                                                            35 ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REGISTRATION NUMBER: 30 REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER: IBM CONTROL OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 æ
                                DKSPSLPVASAPYAVTGKGIRDA
YDSPCLPEAEAMFAINADGVGDA 337
                                                                     ADEFGVAVVITNQVVAQ-VDGAAMFAADPKKPIGGNIIAHASTTRLYLRKGRGETRICKI 314
                                                                                                        AKTYNLAVVLLNQVTTKFTEGSFQLTL-----ALGDSWSHSCTNRLILH-WNGNERYAHL 260
                                                                                                                                          -----YQASAMMVESRYALLIVDSATALYRTDYSGRGELSARQMHLARFLRMLLRL 255
                                                                                                                                                                                                                                                                                                                                                                    80;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Coruzzi, Laura A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           66141 PENNIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ΝY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1155 Avenue of the Americas
                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             650-493-5556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pennie & Edmonds, LLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                No. 6057104e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               05-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                     18.3%; Score 280.5; 30.4%; Pred. No. 1.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Windows
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US/08/964,614A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  30,742
                                                                                                                                                                                                                                                                                                                                                                    46; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8535-0019-999
                                                                                                                                                                                                                                                                                                                                                                                       1.5e-24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2.0b
                                                                                                                                                                                                                                                                                                                                                                                                     DB 3;
                                                                                                                                                                                                                                                                                                                                                                    96;
                                                                                                                                                                                                                                                                                                                                                                    Indels 41;
                                                                                                                                                                                                                                                                                                                                                                                                     Length 339;
                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                     204
                                                                                                                                                                                                                                                                                                                                                                    7:
```

```
US-08-373-134D-2
                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-373-134D-2
                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                    γ
                                                                                                                                                                                                                             밁
                                                                         밁
                                                                                                        QY
                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 2, Application US/08373134D Patent No. 5780296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
APPLICANT: Kmiec, Eric
                                                                                                                                                                                                                                                                                                                                                                                                                                                  uery Match 8.2%; Score 126; DB 1; Best Local Similarity 20.5%; Pred. No. 9.4e-06; Matches 62; Conservative 52; Mismatches 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INFORMATION FOR SEQ ID NO: 2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Kmiec, Eri
APPLICANT: Holloman,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 790-9090
TELEFAX: (212) 869-9741/8864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE CHARACTERISTICS:
LENGTH: 781 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATTORNEY/AGENT INFORMATION: NAME: Friebel, Thomas E.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                   215 DVLSLGRQRHVFSSGSRELDDLLGGGVRSAVLTELVGESGSGKTQMAIQVCTYAALGLVP 274
                                                                                                                                                 393 ALANLHI--AC----VADVEALEHALKYSLPGLIRRLWSSKROSGVSREIGVVVVDNLP 445
                                                                                                                                                                                      138 FLADIYYFRICSYTEQIAVINYMEKFLR-------EHKDVRIVIIDSVT 179
                                                                                                                                                                                                                                                                                                       275 LSQADDHDKGNNTFQSRTFVRDPIHASTKDDTLSDILQSYGMEPSIGSHRGMG--ACYIT 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELEFAX: (212, TELEFAX: 66141 PENNIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME: Friebel, Thomas E.
REGISTRATION NUMBER: 29,
REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: FILING DATE: Januar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                       446 ALFQQDQAAASDIDSLFQRSKMLVEIADALKRISAVQWRGASDCGSSAGRAVLVLNHVSD 505
                                                                                                            180 FHFRQ-----DFEDLALRTRVLSGLSLKLMKIA-----KTYNLAVVLLNQVTT 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TOPOLOGY:
                                    223 KF 224
                                                                                                                                                                                                                                                                                                                                                                                                                        28 DELS---QKHI-TTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAIN----- 76
506 AF 507
                                                                                                                                                                                                                                                                  95 TEGS----FMVERVYQIAEGCIRDILEH-FPHSHEKSSSVQ-------KQLQPER 137
                                                                                                                                                                                                                                                                                                                                            77 ------GLGGKAVYID 94
                                                                                                                                                                                                                             SGGERAAHSIVNRALELASFAINERFDRVYPVCDPTQSSQDADGRRDALLAKAQQLGRRQ 392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10036-2711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1155 Avenue of the Americas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           781 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pennie & Edmonds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     UMBER: US/08/373,134D
January 17, 1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    , William
COMPOSITIONS AND METHODS TO PROMOTE .
HOMOLOGOUS RECOMBINATION IN EUKARYOTIC CELLS AND ORGANISMS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               29,258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   52; Mismatches 74; Indels 114; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7991-007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 1; Length 781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             13;
```

RESULT 10

```
US-09-114-637-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                , MOLECULE TYPE: protein US-09-114-637-2
                                                                                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                                                                                      ₽
                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 2, Application US/09114637
Patent No. 5945339
                                                                                                                                                         B
                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                        밁
                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match 8.2%; Score 126; DB 2; Length 781; Best Local Similarity 20.5%; Pred. No. 9.4e-06; Matches 62; Conservative 52; Mismatches 74; Indels 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEX: 66141 PENNIE INFORMATION FOR SEQ ID NO: 2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Holloman, William
TITLE OF INVENTION: COMPOSITIONS AND METHODS TO PROMOTE
TITLE OF INVENTION: HOMOLOGOUS RECOMBINATION IN EUKARYOTIC CELLS AND ORGANISMS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATTORNEY/AGENT INFORMATION:

NAME: Friebel, Thomas E.

REGISTRATION NUMBER: 29,258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOFTWARE: PatentIn Release #1.0, Version #1.25 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELECOMMUNICATION INFORMATION: TELEPHONE: (212) 790-9090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STREET:
                                                                                                                                                                                             138 FLADIYYFRICSYTEQIAVINYMEKFLR-------EHKDVRIVIIDSVT 179
                                                                                                                                                                                                                                      333 SGGERAAHSIVNRALELASFAINERFDRVYPVCDPTQSSQDADGRRDALLAKAQQLGRRQ 392
                                                                                                                                                                                                                                                                                                                    275 LSQADDHDKGNNTFQSRTFVRDPIHASTKDDTLSDILQSYGMEPSIGSHRGMG--ACYIT 332
                                                                                                                                                                                                                                                                                                                                                                                                   215 DYLSIGRORHVESSGSRELDDLLGGGVRSAVLTELVGESGSGKTOMAIOVCTYAALGLVP 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: US/08/373,134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICATION NUMBER: US/09/114,637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADDRESSEE:
                                                                         446 ALFQQDQAAASDIDSLFQRSKMLVEIADALKRISAVQWRGASDCGSSAGRAVLVLNHVSD 505
                                                                                                                180 FHFRO------DFEDLALRTRVLSGLSLKLMKIA------KTYNLAVVLLNQVTT 222
                                                                                                                                                         393 ALANLHI--AC----VADVEALEHALKYSLPGLIRRLWSSKRQSGVSREIGVVVVDNLP 445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE/DOCKET NUMBER:
506 AF 507
                                    223 KF 224
                                                                                                                                                                                                                                                                                                                                                                                                                                        28 DELS---QKHI-TTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAIN----- 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEFAX:
                                                                                                                                                                                                                                                                                                                                                             TOPOLOGY:
                                                                                                                                                                                                                                                                             95 TEGS----FMVERVYQIAEGCIRDILEH-FPHSHEKSSSVQ------KQLQPER 137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             10036-2711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1155 Avenue of the Americas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      781 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Kmiec, Eric
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (212)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pennie & Edmonds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          869-9741/8864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   William
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              74; Indels 114; Gaps
```

13;

В

```
밁
                                                                            Qγ
                                                                                                                  밁
                                                                                                                                                 Qy
                                                                                                                                                                                         밁
                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                  US-08-969-644-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-08-969-644-8
                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT
                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                       INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 8, Application US/08969644 Patent No. 6096519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                   MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE CHARACTERISTICS
                          310 QYKLNLIANQIRLLRKEDRVDVIFIDYLQLINSSVGENRQNEIADI---SRTLRGLASEL 366
                                                             152 E-QIAVINYMEKFLREHKDVRIVIID------SVTFHFRQDFEDLALRTRVLSGLSLKL 203
                                                                                               255 -LEMSAGQIVERIIANLTGISGEKLQRGDLSKEELFRVEEAGETVR----ESHFYICSDS 309
                                                                                                                                                                      203 TGYKDIDDKGVILAKG----NEVITAARPSIGKTALAIDMAINLAVTQQRRVGFLS---- 254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELECOMMUNICATION INFORMATION TELEPHONE: 703-241-1300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FILING DATE: 07-FEB-1991 ATTORNEY/AGENT INFORMATION:
204 MKIAKTYNLAVVLLNQVTTK 223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOFTWARE: Patentin Rel
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELLEFAX: / L
TELEFAX: 248345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS:
ADDRESSEE: BIRCH, STEWART, KOLASCH & BIRCH STREET: 301 N. Washington Street
CITY: Falls Church
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE OF INVENTION: CTD PLASMID ISOLATED FROM CHLAMYDIA TITLE OF INVENTION: TRACHOMATIS SEROTYPE D, ITS GENES AND PROTEINS ENCODED BY TITLE OF INVENTION: THEM; RECOMBINANT PLASMIDS FOR THE EXPRESSION OF SAID TITLE OF INVENTION: GENES IN HETEROLOGOUS SYSTEMS, PREPARATION OF SAID
                                                                                                                                   92 YIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYT 151
                                                                                                                                                                                                        37 TGSGDLND---ILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVE--CGGLGGKAV 91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                  TOPOLOGY:
                                                                                                                                                                                                                                                                           Local
                                                                                                                                                                                                                                                                                                                                                                                                                     LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE/DOCKET NUMBER: 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COUNTRY:
                                                                                                                                                                                                                                                            51;
                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           22046-0747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Svensson, Leonard R.
                                                                                                                                                                                                                                                                                                                                                                                                                   451 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Virginia
                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      703-241-2848
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                  linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Giuliani, Marzia M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Tecce, Mario F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Comanducci, Maurizio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ratti, Giulio
                                                                                                                                                                                                                                                                                                                                                               protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            13-NOV-1997
                                                                                                                                                                                                                                                                   7.0%; Score 107; DB 3; 25.5%; Pred. No. 0.00067;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US/08/969,644
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IT MI 91A000314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US/07/661,820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        08/467,152
                                                                                                                                                                                                                                                      39;
                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                 DB 3; Length 451;
                                                                                                                                                                                                                                           74; Indels 36; Gaps
                                                                                                                                                                                                                                              9;
```

```
밁
                                                                                       δÃ
                                                                                                                             밁
                                                                                                                                                             οy
                                                                                                                                                                                                                                                                                       ; TOPOLOGY: linear; MOLECULE TYPE: protein US-08-444-189-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-444-189-8
                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                              INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 8, Application US/08444189 Patent No. 6110705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE CHARACTERISTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                             TELECOMMUNICATION INFORMATION: TELEPHONE: 703-241-1300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE OF INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
NUMBER OF SEQUENCES:
152 E-QIAVINYMEKFLREHKDVRIVIID------SVTFHFRQDFEDLALRTRVLSGLSLKL 203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATTORNEY/AGENT INFORMATION: NAME: Svensson, Leonard
                                       255 -LEMSAGQIVERIIANLTGISGEKLQRGDLSKEELFRVEEAGETVR----ESHFYICSDS 309
                                                                                                            203 TGYKDIDDKGVILAKG----NFVIIAARPSIGKTALAIDMAINLAVTQQRRVGFLS---- 254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOFTWARE: PatentIn Release #1.0, Version #1.25 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CORRESPONDENCE ADDRESS
                                                                        92 YIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYT 151
                                                                                                                                              37 TGSGDLND----ILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVE--CGGLGGKAV 91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                                                                               Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                               TELEPHONE: 703-241-2848
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICATION DATE: IT MAPPLICATION NUMBER: IT MAPPLICATION NUMBER: IT MAPPLICATION NATE: 07-FEB-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE/DOCKET NUMBER: 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAME: Svensson, Leonard R. REGISTRATION NUMBER: 30,33
                                                                                                                                                                                                                                                                                                                                                        LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: US/07/991,512 FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         367 -----NIPIVCLSQLSRK 379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ADDRESSEE:
                                                                                                                                                                                                51;
                                                                                                                                                                                                                                                                                                                                       amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          T: 301 N. Washington Street Falls Church : Virginia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22046-0747
                                                                                                                                                                                                                                                                                                                                                                                                             248345
                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Giuliani, Marzia M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Comanducci, Maurizio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Tecce, Mario F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ratti, Giulio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BIRCH, STEWART, KOLASCH & BIRCH
                                                                                                                                                                                                         7.0%;
25.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PCTD PLASMID ISOLATED FROM CHLAMYDIA
TRACHOMATIS SEROTYPE D, ITS GENES AND PROTEINS ENCODED BY
THEM; RECOMBINANT PLASMIDS FOR THE EXPRESSION OF SAID
GENES IN HETEROLOGOUS SYSTEMS, PREPARATION OF SAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IT MI 91A000314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US/07/661,820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US/08/444,189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US/08/180,528
                                                                                                                                                                                            39;
                                                                                                                                                                                                       Score 107; DB 3; Length 451; Pred. No. 0.00067;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1267-202P
                                                                                                                                                                                          Mismatches
                                                                                                                                                                                      74;
                                                                                                                                                                                    Indels 36; Gaps
                                                                                                                                                                                    9
```

```
δõ
                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     닭
                              Š
                                                                                       밁
                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-468-544-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-08-468-544-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 8, Approximately No. 6248563
                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE OF INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
TRY OF THE TOTAL STATE
TOTAL STATE TO THE TOTAL STATE
TOTAL STATE TO THE TOTAL STATE
TOTAL ST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Comanducci, Maurizi
APPLICANT: Tecce, Mario F.
APPLICANT: Giuliani, Marzia M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE: 07-FEB-1991
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELECOMMUNICATION INFORMATION: TELEPHONE: 703-241-1300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            204 MKIAKTYNLAVVLLNQVTTK 223
                        152 E-QIAVINYMEKFLREHKDVRIVIID-----SVTFHFRQDFEDLALRTRVLSGLSLKL
                                                                                       255
                                                                                                                                                                                                   203 TGYKDIDDKGVILAKG----NFVIIAARPSIGKTALAIDMAINLAVTQQRRVGFLS---- 254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     310 QYKLNLIANQIRLLRKEDRVDVIFIDYLQLINSSVGENRQNEIADI---SRTLRGLASEL 366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: IT M. FILING DATE: 07-FEB-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STREET: 301 N. Washington Street CITY: Falls Church
                                                                                                                                          92 YIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYT 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: US 0 FILING DATE: 28-FEB-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US/08/468,544 FILING DATE: 06-JUN-1995
                                                                                                                                                                                                                                                         37 TGSGDLND---ILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVE--CGGLGGKAV 91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REGISTRATION NUMBER: 30,330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LENGTH:
                                                                                       -LEMSAGQIVERIIANLTGISGEKLQRGDLSKEELFRVEEAGETVR----ESHFYICSDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          22046-0747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Svensson, Leonard R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Application US/08468544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Virginia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        451 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -NIPIVCLSQLSRK 379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Comanducci, Maurizio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ratti, Giulio
                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BIRCH, STEWART, KOLASCH & BIRCH
                                                                                                                                                                                                                                                                                                                                          7.0%;
25.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PCTD PLASMID ISOLATED FROM CHLAMYDIA
TRACHOMATIS SEROTYPE D, ITS GENES AND PROTEINS ENCODED BY
THEM; RECOMBINANT PLASMIDS FOR THE EXPRESSION OF SAID
GENES IN HETEROLOGOUS SYSTEMS, PREPARATION OF SAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IT MI 91A000314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US 07/661,820
   -
::
=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <u>ھ</u>
                                                                                                                                                                                                                                                                                                                     39;
                                                                                                                                                                                                                                                                                                               Score 107; DB 4; Length 451; pred. No. 0.00067; 10dels 36;
   ..
   --
                                                                                                                                                                                                                                                                                                               Gaps
                                 203
                                                                                                                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρy
                              RESULT 15
US-08-446-920-2
                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; MOLECULE TYPE: protein US-08-215-928A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-08-215-928A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT
                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
; Sequence 2, Application US/08446920
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE CHARACTERISTICS:
.LENGTH: 273 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATTORNEY/AGENT INFORMATION: NAME: Spratt, Gwendolyn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQUENCES: 8
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION:
                                                                                                                                                   173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                 95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             41
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TELEPHONE: 404/688-07
TELEFAX: 404/688-9880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                 DAEHAL - - - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----NIPIVCLSQLSRK 379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MKIAKTYNLAVVLLNQVTTK 223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         30303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Atlanta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Georgia
Y: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Blaser, Martin J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          404/688-0770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      435
```

```
Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 2, Application US/08215928A Patent No. 5434253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              310 QYKLNLIANQIRLLRKEDRVDVIFIDYLQLINSSVGENRQNEIADI---SRTLRGLASEL 366
                                                                                                   114 NLLVSQPSTGEEALEILETITRS-GGIDLVVVDSVAALTPKAEIDGDMGDQHVGLQARLM
                                                                                                                                                       153 QIAV-----INYMEKFLREHKDVRIVIIDSVT----FHFRODFED--LALRTRVL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NAME: Spratt, Gwendolyn D. REGISTRATION NUMBER: 36,016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                              94 DTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYF-RICSYTE 152
                                                                                                                                                                                                                                                                                                                                                                 35 ITTGSGDLNDILG-GGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYI 93
                                                 SGLSLKLMKIAKTYNLAVVLLNQVTTK 223
                                                                                                                                                                                                                                                                                                                  ISTGSLGLDLALGIGGVPKGRIIEIYGPESSGKTTL-----SLHIIAECQKNGGVCAFI 94
SHALRKITGVLHKMNTTLIFINQIRMK 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Suite 1200, 127 Peachtree Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Thompson, Stuart A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NEEDLE & ROSENBERG, P.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RECOMBINASE-DEFICIENT HELICOBACTER PYLORI AND RELATED METHODS
                                                                                                                                                                                                                                                                                                                                                                                                                                                 6.6%; Score 101; DB 1; Length 273; 22.7%; Pred. No. 0.0015;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US/08/215,928A
                                                                                                                                                                                                                                                                                                                                                                                                                           27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2200.020
                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Version
                                                                                                                                                                                                                                                                                                                                                                                                                           67;
                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                               -DVYYAKRLGVDTE 113
                                                                                                                                                                                                                                                                                                                                                                                                                           66;
                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
```

```
; TELEPHONE: 404/688-0770
; TELEFAX: 404/688-9880
; INFORMATION FOR SEQ ID NO: 2:
SEQUENCE CHARACTERISTICS:
LENGTH: 273 amino acids
TYPE: amino acids
TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE: protein
US-08-446-920-2
Search completed: October 1, 2001, 16:27:48 Job time: 21 sec
                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                          γQ
                                                                                                                        B
                                                                                                                                                                   δÃ
                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PATENTIA: Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/446,920
FILING DATE:
CLASSIFICATION: 4 35
CLASSIFICATION: 4 35
ATTORNEY/AGENT INFORMATION:
NAME: Spratt, Gwendolyn D.
REGISTRATION UNMBER: 36,016
REFERENCE/DOCKET NUMBER: 2200.037
TELECOMMUNICATION INFORMATION:
TELEPHONE: 404/688.0770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match 6.6%; Score 101; DB 1; Length 273; Best Local Similarity 22.7%; Pred. No. 0.0015; Matches 47; Conservative 27; Mismatches 67; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Patent No. 5703219
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Thompson, Stuart A.
APPLICANT: Blaser, Martin J.
TITLE OF INVENTION: RECOMBINASE-DEFICIENT HELICOBACTER
TITLE OF INVENTION: PYLORI AND RELATED METHODS
NUMBER OF SEQUENCES: 11
CORRESPONDENCE ADDRESS:
                                                                                                                      173 SHALRKITGVLHKMNTTLIFINQIRMK 199
                                                                                                                                                                     197 SGLSLKLMKIAKTYNLAVVLLNQVTTK 223
                                                                                                                                                                                                                     114 NLLVSQPSTGEEALEILETITRS-GGIDLVVVDSVAALTPKAEIDGDMGDQHVGLQARLM 172
                                                                                                                                                                                                                                                                  153 QIAV-----INYMEKFLREHKDVRIVIIDSVT----FHFRQDFED--LALRTRVL 196
                                                                                                                                                                                                                                                                                                                     95 DAEHAL------
                                                                                                                                                                                                                                                                                                                                              94 DTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYF-RICSYTE 152
                                                                                                                                                                                                                                                                                                                                                                                                               35 ITTGSGDLNDILG-GGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYI 93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COUNTRY: USA
ZIP: 30303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STREET: Suite
CITY: Atlanta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDRESSEE: NEEDLE & ROSENBERG, P.C. STREET: Suite 1200, 127 Peachtree Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Georgia
                                                                                                                                                                                                                                                                                                                  -----DVYYAKRLGVDTE 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       67; Indels 66; Gaps
```

```
Minimum DB :
Maximum DB :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                             Database
                                                                                                                                                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OM nucleic -
                                                                                                                                                                                                                                                                                                                                                                                                             ••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    seq length: 0 seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nucleic search, using sw model
US-09-537-654-1
1474
1 tegacecacgegte
                                                                                                                                                                                                                                                                                                                                                                                                             EST:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   October 2, 2001, 04:00:14; Search time 1172.69 Seconds (without alignments) 11881.662 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IDENTITY_NUC
Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10228115 seqs, 4726426750 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GenCore version 4.5
Copyright (c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                        gb_est1:*
gb_est2:*
gb_est3:*
gb_est5:*
gb_est6:*
gb_est6:*
gb_est7:*
gb_est8:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              em_estfun:*
em_esthum1:*
em_esthum2:*
em_esthum3:*
em_esthum4:*
em_esthum6:*
em_esthum6:*
                                                                                          9b_est10:*
9b_est11:*
9b_est11:*
9b_est13:*
9b_est14:*
9b_est16:*
9b_est16:*
9b_est16:*
9b_est17:*
9b_est19:*
9b_est19:*
9b_est20:*
9b_est21:*
9b_est21:*
9b_est21:*
9b_est23:*
9b_est23:*
9b_est24:*
9b_est35:*
9b_est35:*
9b_est35:*
9b_est36:*
9b_est37:*
9b_est38:*
9b_est38:*
9b_est38:*
9b_est38:*
9b_est38:*
9b_est38:*
9b_est38:*
9b_est38:*
9b_est38:*
em_esthum8:*
em_esthum9:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20456230
```

```
44: em_esthum10:*
46: em_esthum11:*
47: em_esthum11:*
48: em_esthum11:*
49: em_esthum11:*
50: em_esthum16:*
51: em_esthum16:*
52: em_esthum18:*
53: em_esthum19:*
54: em_esthum19:*
55: em_esthum10:*
56: em_esthum21:*
57: em_esthum21:*
58: em_esthum22:*
69: em_esthum23:*
60: em_esthum23:*
61: em_esthum26:*
62: em_esthum26:*
63: em_esthum26:*
64: em_esthum28:*
65: em_esthum28:*
66: em_esthum28:*
67: em_esthum28:*
68: em_esthum28:*
69: em_esthum28:*
69: em_esthum28:*
69: em_esthum28:*
69: em_esthum28:*
69: em_esthum28:*
69: em_estro11:*
69: em_estro11:*
69: em_estro15:*
69: em_estro15:*
69: em_estro11:*
69: em_estr
```

```
1117:
1118:
1118:
1120:
1221:
1221:
1222:
1224:
1226:
1226:
1226:
1227:
1228:
1228:
1231:
1331:
1331:
1331:
1331:
1331:
1336:
1336:
1336:
1336:
1336:
1336:
9b_est48:*
9b_est59:*
9b_est51:*
9b_est51:*
9b_est52:*
9b_est52:*
9b_est55:*
9b_est55:*
9b_est55:*
9b_est56:*
9b_est59:*
9b_est69:*
9b_est60:*
9b_est60:*
9b_est60:*
9b_est60:*
9b_est60:*
9b_est60:*
9b_est66:*
9b_est60:*
9b_est100:*
9b_est101:*
9b_est102:*
9b_est101:*
9b_est101:*
9b_est102:*
9b_est102:*
9b_est103:*
9b_est100:*
  pred. No. is the number of results predicted by chance to have score greater than or equal to the score of the result being predicted by analysis of the total score distribution.
                                                       em_gss_pln1:
em_gss_pro:
em_gss_rod1:
em_gss_rod3:
em_gss_rod4:
em_gss_rod4:
em_gss_rod4:
em_gss_rod4:
em_gss_vrt1:
em_gss_vrt2:
em_gss_vrt3:
em_gss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        em_gss_hum4:*
em_gss_hum5:*
em_gss_hum7:*
em_gss_hum7:*
em_gss_hum8:*
em_gss_hum8:*
em_gss_hum1:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gb_est110:*
gb_est111:*
gb_htc:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          em_gss_hum1:*
em_gss_hum2:*
em_gss_hum3:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  em_gss_other:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            em_gss_inv3:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             em_gss_fun:*
```

printed, ø

Result

No.

a

ဂ ဂ C C o

```
SOURCE
ORGANISM
                                                                                              VERSION
KEYWORDS
                                                                                                                                                              RESULT
BG051275
                                 REFERENCE
                                                                                                                    ACCESSION
                                                                                                                                          DEFINITION
 TITLE
                      AUTHORS
                                                                                                                                                                                                                                                                        Score
                           Sorghum propinguum
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnollophyta; Liliopsida; Poales; Poaceae; PACC
clade; Panicoideae; Andropogoneae; Sorghum.
1 (bases 1 to 596)
                                                                                                                    BG051275 596 bp mRNA EST 25-JAN-2(FM1_54_D07.gl_A003 Floral-Induced Meristem 1 (FM1) Sorghum proplinguum cDNA, mRNA sequence.
BG051275
An ES
                     Cordonnier-Pratt, M.-M.,
                                                                                                BG051275.1
EST.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query
                                                                                                                                                                                                                                                                                                                                                                                            database from Sorghum: floral-induced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                           GI:12504866
                                                                                                                                                                                                                                                                                                                   DB
                                                                                                                                                                                                                                                                                                                                                                        148
12
31
174
174
153
146
106
1184
1188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       167
167
174
154
154
168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AZ918279
BG050955
AW310460
AW3203630
AW784884
BG471853
AI184177
BE390908
BE4074728
BG474751
BG506121
BG506121
BG72049
BG872049
BG888865
AW327505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                 AV629583
AA641847
BG131647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BF448483
AA861390
                                                                                                                                                                                                                                                                                                                  BG403188
BF240492
AL533302
BG521224
BG521224
BW604548
BE2644861
AZ687391
AZ687391
AL533348
AZ57048
BE492323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BG606048
BE517872
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BG051275
BG605725
                      Gingle, A., Sudman, M., Marsala, C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SUMMARIES
                                                                                                                                                                                                          ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                  AA861390 ak37c04.s
AV629583 AV629583
AA641847 ms19903.r
BG131647 EST464539
BG405188 602418623
BF240472 601875867
AL533302 AL533302
BG521224 ps44c04.y
AW604548 RC2-c7029
BE281543 601155143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BGG06048 RHIZ2_80

BE517872 WHE0804H

AZ918279 1006003H0

AZ918278 1006003H0

AZ918278 1006003H0

BG050955 FMI_54_D0

AW310460 sf36609.x

AW203630 sf36009.y

AW784884 115201 MA

BG471853 602513325

AII84177 qf46e08.x

BE390908 601283055

BE4774752 60130352

BG474752 60130352

BG474752 60130352

BG474752 60150756

BG506121 6018605056

BF672049 602517579

BG506121 60186056

BF672049 602152480

BF515288 UI-H-BW1-AQ848265 LMAJFV1_1

AW327505 dq04b03.x

BF4448483 7771001.x
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Description
                                                                                                                                                                                                                                                                                                                                        AZ544861 ENTEB69TF
AZ687391 ENTJB81TF
AL533348 AL533348
AZ677092 ENTKU28TR
                                                                                                                                                                                                                                                   AL057654 Drosophil
AA779979 zj24a05.s
AQ254558 CpG0696A
                                                                                                                                                                                                                                                                                   AQ641696 RPC193-Dp
AA702444 z189b09.s
BF216102 601883577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BG051275 FM1_54_D0
BG605725 RHIZ2_80_
BG606048 RHIZ2_80_
                                                                                                                                                                                                                                                                                                                   AZ549256 ENTFJ20TF
BE492323 WHE0557_E
                                                                                                                                                                                                                                                                                                                                                                                                                                                   BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    JOURNAL COMMENT
                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                                                     밁
                     Qy
                                             멍
                                                                 ρ
                                                                                      Вb
                                                                                                          δÃ
                                                                                                                                 밁
                                                                                                                                                     δÃ
                                                                                                                                                                           В
                                                                                                                                                                                             Qy
                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURES
                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                         Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     source
                                                                                                                                                        1210
                                                                                                                                                                                                 1150
                                                                                                                                                                                                                                                               1390
                                                                                                                                                                                                                                            1090
                                                                                                                                                                           241
                                                                                                                                                                                                                       181
                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                     970 actactaaatttacagaagggtcatttcaattgactcttgctctaggtgacagctggtcc
                                                                                                                                                                                                                                                                                                                                                                 910 ttgaagttaatgaagattgcaaagacatataacttggcagttgtcttgttgaaccaagtc
                                                                                         361
                                                                                                                                                                                                                                                                                                           61 ACTACTAAATTTACTGAAGGGTCATTTCAATTAACTCTTGCTCTAGGTGACAGCTGGTCC
                                                                                                                                                                                                                                                                                                                                                     1 TTGAAGTTAATGAAGATTGCAAAGACATATAACCTGGCAGTTGTCTTGTTGAACCAAGTC
                                                                                                                                                                                                                    gcacttgtatgtccactacgctcctgcagctttcttcgccatggatctttttggactagtg
                                                                                                                                                                                       agagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattcttggtgtcaa 1209
    TGAACATGTGGCACATCTTACATTCAGTAA
                        tgaacatctggcccatcgtacattcagtaa 1419
                                             CAAACCGACC---ATAGAGAAGTAGATGCAACACAGACAGGCTACTATAGTGTTTTGTATC
                                                        aggtgagactggagaatagtaccattttgttgattctcagttgctttgtgccgttggcta 1329
                                                                                                                                  GCACTTGTATCTCCACTATGCTCTTGCAGCTTTCTTCACCATGGATCTTTGGGGCAAGTT
                                                                                                                                                                            AGAGATGCTGTGAGTCCAAACCACAAACGAGCCCGAGTAACGTAGCATTCTTGGTGTCAA
                                                                                                                                                                                                                                                                                                                                                                                                472;
                                                                                         AGGTGAGACTGGAGAATCATACCACTTTGCTGATTCTCAATTGCTTTGTGCCGTTAGCTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Unpublished (2000)
Contact: Cordonnier-Pratt MM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Seq primer: PolyTMix
High quality sequence start:
High quality sequence stop:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   is 20.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Email: mmpratt@uga.edu
Sequences have been trimmed
below Phred quality 16. The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Tel: 706 542 1860 Fax: 706 542 1805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The University of Georgia Plant Sciences Building, Rm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          POLYA=Yes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Department of Botany
                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="Organ: Floral-induced meristems; vector:
/note="Organ: Floral-induced meristems; vector:
pBluescript II from Lambda Zap II; Site_1: XhOI; Site_2:
ECORI; mature plants were placed in a growth chamber for
15 days with 16 hr darkness and 8 hr light (flowering is
induced by short-day conditions); 16 days after being
returned to the greenhouse under natural long days during
late April/early May, meristems were harvested The
library was made from poly-A RNA in the cloning vector
lambda Zap II. Clones to be sequenced were prepared by
mass excission."

a 132 c 129 g 165 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /organism="Sorghum propinguum"
/db_xref="taxon:132711"
/clone_lib="Floral-Induced Meristem 1 (FM1)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . 596
                                                                                                                                                                                                                                                                                                                                                                                                          29.7%;
92.5%;
                                                                                                                                                                                                                                                                                                                                                                                                 0,:
                                                                                                                                                                                                                                                                                                                                                                                                          Score 438;
Pred. No. 2
                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                to exclude PolyA, vector and regions threshold for highest quality sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2502,
                                                                                                                                                                                                                                                                                                                                                                                                 DB 173;
2.8e-105;
hes 35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Athens, GA 30602-7271,
                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                  Indels
```

Ψ

Gaps

1:

60 969

120

LOCUS

420

477

300

O O

a 0 0 a C

```
Ş
                                          Дb
                                                                           ğ
                                                                                                                   멍
                                                                                                                                                οy
                                                                                                                                                                                          망
                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BG605725
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local S
Matches 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM
                                                                                                                                                       1206
1326 gctaccaaccaaccttaagagagaagtaaatacaacagaacaggctaatatagtgttttg
                                                                                                                                                                                                                                 1146
                                                                                                                                                                                                                                                                                                      1086
                                                                                                                                                                                                                                                                                                                                                                               1026
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                              1 AGTCACTACTAAATTTACTGAAGGGTCATTTCAATTAACTCTTGCTCTAGGTGACAGCTG
                                                         agtgaggtgagactggagaatagtaccattttgttgattctcagtttgctttgttgccgttg 1325
                                                                                                                                                                                                                                                                                   tcttgataagtctccttcacttccagtagcctcagcaccgtatgcagtgacaggcaaagg 1145
                                                                                                                                                                                                                                                                                                                                                          TCAAGCACTTGTATCTCCACTATGCTCTTGCAGCTTTCTTCACCATGGATCTTTGGGGCA
                                                                                                                                  tcaagcacttgtatgtccactacgctcctgcagctttcttcgccatggatcttttttggact 1265
                                                                                                                                                                                      GATTAGAGATGCTGTGAGTCCAAACCACAAACGAGCCCGAGTAACGTAGCATTCTTGGTG
                                                                                                                                                                                                         gattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattcttggtg
                                                                                                                                                                                                                                                               CCTTGATAAGTCTCCTTCACTTCCAGTAGCCTCAGCACCGTATGCAGTGACAGGCAAAGG
                                                                                                                                                                                                                                                                                                                                      agtcactactaaatttacagaagggtcatttcaattgactcttgctctaggtgacagctg 1025
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Department of Botany
The University of Georgia
Plant Sciences Building, Rm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Unpublished (2000)
Contact: Cordonnier-Pratt MM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryotā; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; PACC clade; Panicoldeae; Andropogoneae; Sorghum.

1 (bases 1 to 543)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BG605725 543 bp mRNA EST 17-APR-2001 RHIZ2_80_G06.g1_A003 Rhizome2 (RHIZ2) Sorghum propinguum cDNA, mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   High quality sequence start: High quality sequence stop: !
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Email: mmpratt@uga.edu
Seq_primer: PolyTMix
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       An EST database from Sorghum: Sorghum propinquum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Cordonnier-Pratt, M.-M., Gingle, A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sorghum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sorghum propinguum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              706 542 1860
706 542 1805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    מ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    propingum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /clone_lib="Rhizome2 (RHIZ2)"
/note="Organ: Rhizomes; Vector: pBluescript II from Lambda Zap II; Site_1: XhOI; Site_2: EcoRI; The library was made from poly-A RNA in the cloning vector lambda ZAP II. Clones to be sequenced were prepared by mass excision."

a 122 c 119 g 150 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Sorghum propinquum"
/db_xref="taxon:132711"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      25.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 382; DB 155;
Pred. No. 1.9e-90;
0; Mismatches 35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2502,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Athens,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Paterson, A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sudman, M. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         rhizomes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       543;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ω,.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                           1205
                                                                                                                                                                                        240
                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۲,
```

```
밁
                               δÃ
                                                                                            Ω
                                                                                                                             В
                                                                                                                                                           Q
                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                        QΥ
                                                                 밁
                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
BG606048
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                   ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            source
   454
                                  598
                                                                                                                               334
                                                                                                                                                                                                                         418
                                                                394
                                                                                                                                                                                            274
                                                                                                                                                                                                                                                                       358 tcaggagcccagaatgcctgggatatgttctctgatgagctgtcacagaaacacatcact 417
                                                                                                                                                                                                                                                     214 TCTGGGGCCCAGAATGCTTGGGATATGCTATCTGATGAGCAGTCACAGAAACACATCACT 273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                      Local
                                                                             ACTGGTGCTGGTGACCTCAATGACATACTTGGTGGCGGGATTCACTGCAAAGAAGTTACT 333
                                                                                                                                                                                                         actggttctggtgacctcaatgacatacttggtggcgggattcactgcaaagaagttact 477
GGAAGTTTCATGGTTGAACGTGTCTACCAGATTGCTGAAGGGTGTATCAGGGACATACTG
              ggcagtttcatggttgaacgtgtctaccagattgctgaagggtgtattagggacatactg
                                                              GTACAAATCCCAGTGGAATATGGTGGCCTTGGTGGGAAAGCAGTTTATATCGATACAGAA
                                                                                                                           tatctgaacatctggcccatcgtacattcagtaa 1419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             383;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Email: mmpratt@uga.edu
Seq primer: JEN REV
High quality sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       The University of Georgia
Plant Sciences Building, Rm.
Tel: 706 542 1805
Fax: 706 542 1805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sorghum propinquum
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; PACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Contact: Cordonnier-Pratt Department of Botany
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cordonnier-Pratt, M.-M., Gingle, A., Paterson, A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BG606048 614 bp
RHIZ2_80_G06.b1_A003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               clade; Panicoideae; Andropogoneae;
1 (bases 1 to 614)
                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           POLYA-No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                An EST database from Sorghum: Sorghum propinquum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sorghum propinguum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BG606048.1
                                                                                                                                                                                                                                                                                                                                                                                                                  160
                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       quality sequence stop:
                                                                                                                                                                                                                                                                                                                                                                                                           /note="Organ: Rhizomes; Vector: pBluescript II from Lambda Zap II; Site_1: XhoI; Site_2: ECORI; The library was made from poly-A RNA in the cloning vector lambda ZAP II. Clones to be sequenced were prepared by mass excision." a 146 c 160 g 148 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /clone_lib="Rhizome2 (RHIZ2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /organism="Sorghum propinguum"
/db_xref="taxon:132711"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GI:13656019
                                                                                                                                                                                                                                                                                                                                     25.3%;
95.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      mRNA
Rhizome2
                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                   Score 372.2; DB 1
Pred. No. 7.7e-88;
                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2502,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (RHIZ2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Athens,
                                                                                                                                                                                                                                                                                                                                                   DB 155;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sorghum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sorghum
                                                                                                                                                                                                                                                                                                                    18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GA
                                                                                                                                                                                                                                                                                                                                                  Length 614;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30602-7271, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     propinguum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sudman, M. and Pratt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    17-APR-2001
                                                                                                                                                                                                                                                                                                                    0,
                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cDNA, mRNA
                                                              453
                                                                                                                           393
                               657
                                                                                                                                                                                                                                                                                                                    0
```

```
RESULT
BE517872
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                           γg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMENT
В
                                                                                                밁
                                                                                                                                      QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KEYWORDS
                                                                                                                                                                                                                                                                                                                                      BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM
                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              658
                                                401
                                                                                                                              341 cacaacagaagtacgtttcaggagcccagaatgcctggggatatgttctctgatgagctgt 400
  164
                                                                                                104 CGCAGAAGCTGCTCCTACGAGGAGCCCAAAATGCATGGGATATGCTGTCTGAGGAGCAAT 163
                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CATTTCCTGGCGGACATCTATTACTTCCGAATATGCAGTTA 614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gagcactttcogcacagccatgagaagtcctcttctgtccaaaaaacaattacagcctgag 717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GAGCACTTTCCGCACAGCCATGAGAAGTCCTCTTCTGGCAAAAAAACAATTACAGCCTGAG 573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cgtttcctggcggatatctattacttccggatatgcagtta 758
  CACAGAAACACATCACTACTGGCTCTGGTGACCTGAACGGCATACTTGGTGGAGGGATTC 223
                      cacagaaacacatcactactggttctggtgacctcaatgacatacttggtggcgggattc 460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Email: oandersn@pw.usda.gov
Sequence have been trimmed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Contact: Olin Anderson
US Department of Agriculture, Agriculture Research
West Area, Western Regional Research Center
800 Buchanan Street, Albany, CA 94710, USA
Tel: 5105595773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 (bases 1 to 603)
Anderson,O.D., Chao,S., Choi,D.W., Close,T.J., Fenton,R.D., Han ,P.S., Hsia,C.C., Kang,Y., Lazo,G.R., Miller,R., Rausch,C.J., Seaton,C.L. and Tong,J.C.
The structure and function of the expressed portion of the wheat genomes - Vernalized crown cDNA library
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     bread wheat.
Triticum aestivum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BE517872.1 GI:9741902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WHE0804_H03_P062S Wheat vernalized crown cDNA libra aestivum cDNA clone WHE0804_H03_P06, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BE517872 603 bp
WHE0804_H03_P06ZS Wheat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               quality sequence with phred score less than
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Pooldea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Seq primer: Stratagene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Triticeae;
                                                                                                                                                                                                                                                                                                                                         175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5105595818
                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                         ۵
                                                                                                                                                                                                                                                                                                                                                                                                     /lab_host="E. coli SOLR"
/note="Vector: Lambda Uni-ZAP XR, excised phagemid;
/note="Vector: Lambda Uni-ZAP XR, excised to RNA, and poly(A) RNA were prepared, a cDNA library was made, and the cDNA clones were in vivo excised to give pBluescript phagemids in the TJ Close lab (Choi, Close, Fenton) at the University of California, Riverside, Plasmid DNA the University of California, Riverside, Plasmid DNA
                                                                                                                                                                                                                                                                                                                                    preparations and DNA sequencing were performed Anderson lab (all other authors)."
136 c 158 g 134 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /db_xref="Cninese Spring"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /clone_lib="Wheat vernalized crown cDNA library"
/tissue_type="Crown tissue of seedling"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Triticum aestivum"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /dev_stage="Five-week old seedling"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          clone="WHE0804_H03_P06"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          . 603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Triticum.
                                                                                                                                                                                                               24.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           trimmed to remove vector
                                                                                                                                                                                           Score 367.2; DB 1
Pred. No. 1.6e-86;
0; Mismatches 83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SK primer.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mRNA
                                                                                                                                                                                                                                           DB 136; Length
                                                                                                                                                                                                83;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cDNA library Triticum
                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sequence and low 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Poaceae; Pooideae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 08-AUG-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Service, Pacific
                                                                                                                                                                                                0;
                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                         in the OD
                                                                                                                                                                                                0,
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
AZ918279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DEFINITION
                                                                                                                                                                                                                                                                                                         FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JOURNAL
                                                                                                                                                                                                                                                                               source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        761
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  641
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tttatatagatacagagggcagtttcatggttgaacgtgtctaccagattgctgaagggt 640
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             actgcaaagaagttactgagatcggtggcgtcccaggggttggtaaaactcaactgggga 520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GAATAGTTATTGATAGT 603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gtatagttattattgatagt 840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aacaattacagcctgagcgtttcctggcggatatctattacttccggatatgcagttaca 760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCATCAGTGACATAATGGAGTATTTTCCATGCCACCATGACAAGTCGTCATCTGGCCAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gtattagggacatactggagcactttccgcacagccatgagaagtcctcttctgtccaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ttcaactagcaatcaatgtacaaatcccagtggaatgtggtggccttggtgggaaagcag 580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTGTAAAGAAGTTACTGAGATAGGTGGGGTTCCAGGAATTGGTAAAACTCAACTGGGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CTGAACAGATTGCGGTGATAAACTATCTGGAGAAATTCCTCGGAGAACATAAAGATGTGA 583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccgaacaattgcagtcataaactacatggagaagttcctcagagaggcataaagatgtgc 820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAAATCTGCAGCCCGAGAGTTTCCTGGCAGGAATCTACTTCCGAATATGCAGCTACA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TTCAGCTAGCAATCAACGTCCAAATTCCCGTGGACTATGGTGGCCTTGGCGGCAAAGCAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Unpublished (2001 Contact: Walbot V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; PACC clade; Panicoideae; Andropogoneae; Zea.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1006003H03.x2 1006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Stanford University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Zea mays
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Zea mays.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AZ918279.1
                                                                                                                                                                                                                                                                                                                                Class: transposon-tagged
                                                                                                                                                                                                                                                                                                                                                  Possible ligation site of ends cut by 2 different endonucleases. Reverse complemented post-ligation sequence from source sequence plate: 1006003 row: H column: 03
                                                                                                                                                                                                                                                                                                                                                                                                                                     Tel: 650 723 2227 Fax: 650 725 8221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            855 California Ave, Palo Alto, CA 94304, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Department of Biological Sciences
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Maize genomic sequences found using engineered RescueMu transposon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Walbot, V.
                                                                                                                                                                                                                                                                                                                                                                                                                   Email: walbot@stanford.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (bases 1 to 523)
                                                                                                         /tissue_type="leaf"
/dev_stage="adult"
/lab_host="DH10B"
/note="Organ"
                /note="Organ: leaf; Vector: RescueMu (engineered from pBlueScript backbone); Site_1: BamH1; Site_2: BglII; RescueMu is a 4.9 kb, modified maize Mu transposon designed to allow plasmid rescue from total genomic DNA. Mu elements insert preferentially into transcription
units. For more information on RescueMu, go
                                                                                                                                                                                            /organism-"Zea mays"
/cultivar-"mixed background W23/A188/B73"
/db_xref-"taxon:4577"
/clone_lib-"1006 - RescueMu Grid G"
                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             bp DNA GSS 20-MAR-2
6 – RescueMu Grid G Zea mays genomic, DNA
                                                                                                                                                                                                                                                                                                                                                                         sequence from source sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     343
```

```
ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
AZ918278
                                                                                      FEATURES
                                                                                                                                                                                                                                                                             COMMENT
                                                                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BASE COUNT
                                                                                                                                                                                                                                                                                                               TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM
                                                                                                                                                                                                                                                                                             JOURNAL
                                                                                                                                                                                                                                                                                                                              AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                      source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATCAATCTGGC 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      atcaatctggc 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CTGCAGTTCTTCTTCCCCCCAATCAGTACCACCTCTCCAAGTGGCAATCACCATGGGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ctgcagttctcttcttcccccaatcagtaccacctctccaagtggcaatcaccatgggag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agatatgagaggtggaggtggctacaacgggtcggcggctgtgagatactgaaatccgca 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGCGTCGACGTAAGCGGCTGCGTGGCGCCCACCGACGGAGGCTACGAGCGGTTGTGGAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggcgtcgacgtaagcggctgcgtggcgccaccgacggaggctacgagcggttgtgggaggc 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9C99T9a9CC99a9CCC99a9aC9aC99C9C9C9CgC9aCtCCCCCCtaagCgacagCggc 136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AGATATGAGAGGTGGAGGTGGCTACAACGGGTCGGCGGCTGTGAGATACTGAAATCCGCA
                                                                                                                                                                                     Stanford University
855 California Ave, I
Tel: 650 723 2227
Fax: 650 725 8221
                                                                                                                                                                                                                                                                                                                                                                                                                                                 AZ918278
AZ918278.1
GSS.
                                                                                                             Email: walbot@stanford.edu
Possible ligation site of ends cut by 2 different endonucleases
Reverse complemented post-ligation sequence from source sequence
Plate: 1006003 row: H column: 03
                                                                                                                                                                                                                                                                        Unpublished (2001
Contact: Walbot V
                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; PACC clade; Panicoideae; Andropogoneae; Zea.
                                                                                                                                                                                                                                                         Department of Biological Sciences
                                                                                                                                                                                                                                                                                                                              Walbot, V.
                                                                                                                                                                                                                                                                                                                                                                                                                  Zea mays
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AZ918278
1006003H03.x1
                                                                                                                                                                                                                                                                                                            Maize genomic sequences
                                                                                                                                                                                                                                                                                                                                              (bases 1 to 455)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                    transposon-tagged
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      site 'www.zmdb.iastate.edu' and follow the links for 'RescueMu.' Grid G was grown at Stanford in 2000. DNA was extracted from leaf punches, double digested using BamHI and BglII, and ligated to form circular plasmids. DHIOB cells were transformed and then screened on LB plates with ampicillin."
                /cultivar="mixed background W23/A188/B73"
/db_xref="taxon:4577"
                                                  /organism="Zea mays"
                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   455 k
1006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         21.1%; 100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -
طو
                                                                                                                                                                                                                       Palo Alto, CA 94304, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RescueMu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 311; DB 251;
Pred. No. 1.2e-71;
0; Mismatches 0;
                                                                                                                                                                                                                                                                                                        found using engineered
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
RescueMu Grid G"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Grid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            135 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 251;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     G
                                                                                                                                   sequence from source sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Zea mays genomic,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 523;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                        RescueMu transposon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0,
```

밁 Qy В Q 멍

LOCUS

Ş Дb Ş 밁 Qγ 뫄

SOURCE

```
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT
BG050955
                                                                                                                                                         COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BASE CO
                                                                                                                                                                                                                                                                                                      REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DEFINITION
                                                                                                                                                                                                                TITLE
                                                                                                                                                                                                                                                                       AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     136 cggcgtcgacgtaagcggctgcgtggcgccaccgacggaggctacgagcggttgtggagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   actgcagttctcttcttcccccaatcagtaccacctctccaagtggcaatcaccatggga 315
Unpublished (2000)
Contact: Cordonnier-Pratt MM
Contact: Cordonnier-Pratt MM
Department of Botany
The University of Georgia
Plant Sciences Building, Rm. 2
Tel: 706 542 1805
Fax: 706 542 1805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GATCAATCTGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CAGATATGAGAGGTGGAGGTGGCTACAACGGGTCGGCGGCTGTGAGATACTGAAATCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cagatatgagaggtggaggtggctacaacgggtcggcggctgtgagatactgaaatccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gatcaatctggc 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GGCGGTGAGCCCGGAGCCCGGAGACGACGCGCGCGCGACTCCCCCCTAAGCGACAGCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGGCGTCGACGTAAGCGGCTGCGTGGCGCCACCGACGGAGGCTACGAGCGGTTGTGGAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         99c9gtgagccggagcccggagacggcggcggcgactcccccctaagcgacagcgg 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 311;
                                                                                                                                                                                                                                                                                             Sorghum propinquum
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; PACC
clade; Panicoideae; Andropogoneae; Sorghum.
1 (bases 1 to 481)
                                                                                                                                                                                                          An EST database from Sorghum:
                                                                                                                                                                                                                                                                 Cordonnier-Pratt, M.-M., Gingle, A., Sudman, M., Marsala, C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BG050955 481 bp mRNA EST FM1_54_D07.b1_A003 Floral-Induced Meristem
                                                                                                                                                                                                                                                                                                                                                                                                                                                Sorghum propinquum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BG050955.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              propinquum cDNA, mRNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               91 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      //lab_host="DHIOB"
//lab_host="D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /tissue_type="leaf"
/dev_stage="adult"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GI:12504184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pred. No. 9.8e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      300;
                                                             2502,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8e-69;
                                                                Athens, GA 30602-7271, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 (FM1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 455;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     25-JAN-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ۲,
                                                                                                                                                                                                                                                                    and Pratt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           273
```

۲.

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                      KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                     VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                           ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AW310460/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BASE COUNT
JOURNAL
                                                                                                                                                                                                                                                                                                                    ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ggcagtttcatggttgaacgtgtctaccagatt 630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | tcaggagcccagaatgcctgggatatgttctctgatgagctgtcacagaaaacacattact 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gtacaaatccccagtggaatgtggtggccttggtgggaaagcagtttatatagatacagag 597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              actggttctggtgacctcaatgacatacttggtggcgggattcactgcaaagaagttact 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TCTGGGGCCCAGAATGCTTGGGATATGCTATCTGATGAGCAGTCACAGAAACACATCACT 268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGAAGTTTCATGGTTGAACGTGTCTACCAGATT 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTACAAATCCCAGTGGAATATGGTGGCCTTGGTGGGAAAGCAGTTTATATCGATACAGAA 448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACTGGTGCTGGTGACCTCAATGACATACTTGGTGGCGGGATTCACTGCAAAGAAGTTACT 328
                           Shoemaker,R., Keim,P., Vodkin,L., Erpelding,J., Coryell,V., Khanna,A., Bolla,B., Marra,M., Hillier,L., Kucaba,T., Martin,J., Beck,C. Wylie,T., Underwood,K., Steptoe,M., Theising,B., Allen,M., Bowers,Y., Person,B., Swaller,T., Gibbons,M., Pape,D., Harvey,N., Schut,Y., R., Ritter,E., Kohn,S., Shin,T., Jackson,Y., Cardenas,M., McCann,R., Waterston,R. and Wilson,R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AW310460 670 bp mRNA EST 17-JUL-2000 sf36609.x1 Gm-c1028 Glycine max cDNA clone GENOME SYSTEMS CLONE ID: Gm-c1028-2058 3' similar to TR:022144 022144 PUTATIVE DNA REPAIR
                Public Soybean EST Project
                                                                                                                                                                                                                              Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Sosidae; eurosids I; Fabales; Fabaceae; Papilionoideae; Glycine.
                                                                                                                                                                                                                                                                                                                 soybean.
Glycine max
                                                                                                                                                                                                                                                                                                                                                                         EST
                                                                                                                                                                                                                                                                                                                                                                                                                           AW310460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequences have been trimmed to exclude PolyA, vector and regions below Phred quality 16. The threshold for highest quality sequence
                                                                                                                                                                                                                                                                                                                                                                                               AW310460.1 GI:6726061
                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROTEIN ; , mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Seq primer: JEN REV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         High quality sequence stop: 479
                                                                                                                                                                                                          (bases 1 to 670)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        112 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BCORI; mature plants were placed in a growth chamber for 15 days with 16 hr darkness and 8 hr light (flowering is induced by short-day conditions); 16 days after being returned to the greenhouse under natural long days during late April/early May, meristems were harvested The library was made from poly-A RNA in the cloning vector lambda ZAP II. Clones to be sequenced were prepared by mass excision."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Organ: Floral-induced meristems; Vector:
pBluescript II from Lambda Zap II; Site_1: XhoI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /clone_lib="Floral-Induced Meristem 1 (FM1)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /organism="Sorghum propinquum"
/db_xref="taxon:132711"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             17.2%;
95.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 252.8; DB 1/3;
Pred. No. 3.2e-56;
""smatches 13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 173; Length 481;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Site_2:
                                                                                                                                                   Beck, C.,
                                                                                                                                                                         Khanna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0,
```

Š 밁 δÃ 밁 Ş 밁 δÃ 밁

```
Qy
                                                                   DЪ
                                                                                                                      Qy
                                                                                                                                                                                          В
                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                          γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  source
                                                                   545
                                                                                                                             840
                                                                                                                                                                                          605
                                                                                                                                                                                                                                                                                                                    665
                                                                                                                                                                                                                                                                                                                                                 720 tttcctggcggatatctattacttccggatatgcagttacaccgaacaaattgcagtcat 779
900 tggattatcattgaagttaatgaagattgcaaagacatataacttggcagttgtcttgtt 959
                                                                                                tgttactttccactttcgacaagattttgaagatctggcactgaggaccagagtgctaag 899
                                                                                                                                                                                                                   aaactacatggagaagttcctcagagagcataaagatgtgcgtatagttattattgatag 839
                                                                TGTTACTTTCCACTTCCGCCAAGACTTTGATGATATGGCTCTCAGGACTCGATTACTCAG
                                                                                                                                                                                                                                                                                                                 TATCTTAGAAAATATATTCTATNTTCGTGTTTTGCAGCTACACTGAGCAAATTGCTTTGAT 606
                                                                                                                                                                                          AAATTACTTGGACAAATTCATCACAGAGAATAAAGATGTAAAGATCCTCATTGTTGACAG 546
                                                                                                                                                                                                                                                                                                                                                                                                                                           347;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            High quality sequence stop: 462.
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This clone is available through: Genome Systems, Inc. 4633 World Parkway Circle St. Louis, Missouri 63134 For further information call: (800) 430-0030 or (314) 427-3322 FAX:(888) 919-3324 or (314) 427-3324 or contact: clones@genomesystems.com or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Contact: Shoemaker R/Public Soybean EST Project
Public Soybean EST Project
Washington University School of Medicine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Other_ESTs: sf36d09.yl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Tel: 314 286 1800
Fax: 314 286 1810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4444 Forest Park Parkway, Box 8501,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Insert Length: 1400 Std Error: 0.00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Email: est@watson.wustl.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      info@genomesystems.com web site: www.genomesystems.com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              218
                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            first-strand synthesis primer was used. An 'anchor' nucleotide (V=A,C, or G) was added to the 3' end of the primer [GAGAGAGAGAGAGAGAGAGAGAGAGTQTCCGAG(T)18V] to anchor the primer at the 5' end of the poly(A) tract. After second-strand synthesis, the cDNA ends were filled in with cloned pfu DNA polymerase, ligated to EcoRI adapters and subsequently phosphorylated. The XhOI site within the first-strand synthesis primer was then restricted by digestion with XhOI, all XhOI sites in the cDNA would be protected by their hemimethylated status. The cDNA constructs were size-fractionated with a 500bp cutoff, using GibcoBRL Life Technologies' cDNA Size Fractionation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           library was constructed by Dr. Paul Keim and Coryell."

117 c 125 g 209 t 1 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       japonicus, strain USDA110 priot to harvest. Stratagene's CDNA synthesis Kit (catalog number 200401) was used to synthesize the CDNA. First-strand synthesis was performed with 5-methyl dCTP, hence the ligated CDNA was hemimethylated. A modification of Stratagene's
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  white and blue colonies appear to contain recombinant plasmids with cDNA inserts, based on size (n=25). The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            column. The column eluent was then ligated into Stratagene's pBluescript II XR Predigested vector (pBluescript II XK+) that has been digested with EcoRI and XhoI, and phosporylated by Stratagene). Both the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="Vector: pBluescript II XR; Site_1: EcoRI; Site_2: XhoI; The mRNA was isolated from roots of Glycine max 'Supernod' plants generously donated by Dr. Gary Stacey. The seedlings were innoculated with Bradyrhizobium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /clone_lib="Gm-c1028"
/tissue_type="roots of 'Supernod' plants"
/lab_host="DH10B"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /organism="Glycine max"
/db_xref="taxon:3847"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /clone="GENOME SYSTEMS CLONE ID: Gm-c1028-2058"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       16.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        125 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 244.6; DB 114; Length 670;
                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5.1e-54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          St. Louis, MO 63108, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                       150;
                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                       ω,.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Dr. Virginia
                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
AW203630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOURCE
                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Locus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1020
                                                                                                                                                                                                                                                                                source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gaaccaagtcactaaatttacagaagggtcatttcaattgactcttgctctaggtga 1019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TGAGTAGGAAGATAGTCTAT 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ttggtgtcaagcacttgtat 1219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TAGAGGGATACGCAATTCT---ACTTCAAGCTGCAAACGAATCAAGATGATGTGAGATTT 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caaagggattagagatgctgtgagctcaaaccacaagcgagcccgagtaacgtagcattc 1199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cycacatcttgataagtctccttcacttccagtagcctcagcaccgtatgcagtgacagg 1139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TAGTTGGTCGCATTCATGCACAAATAGGATAATCTTGTTTTGGAATGGCAACGACGACA 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGAAATGGCTTTGAAGTTGATGAAGCTTGCAAAAAATTCCGTTTGGCTGTTATGTT 426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CGCATTTATCGACAAGTCCCCTTCTCTGAAATCAGCATCAGCTCCATATTCTGTGACAAC 246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Shoemaker, R., Keim, P., Vodkin, L., Erpelding, J., Coryell, V., Khanna, A., Bolla, B., Marra, M., Hillier, L., Kucaba, T., Martin, J., Beck, C. Wylie, T., Underwood, K., Steptoe, M., Theising, B., Allen, M., Bowers, Y., Person, B., Swaller, T., Gibbons, M., Pape, D., Harvey, N., Schurk, R., Ritter, E., Kohn, S., Shin, T., Jackson, Y., Cardenas, M., McCann, R., Waterston, R. and Wilson, R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 soybean.
Glycine max
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sf36d09.yl Gm-c1028 Glycine max cDNA clone GENOME SYSTEMS CLONE ID: Gm-c1028-2058 5' similar to TR:022144 022144 PUTATIVE DNA REPAIR
                                                                                                                                                                                                                                                                                                                                                            Email: est@watson.wustl.edu
This clone is available through: Genome Systems, Inc. 4633 World
Parkway Circle St. Louis, Missouri 63134 For further information
call: (800) 430-0030 or (314) 427-3222 FAX:(888) 919-3324 or (314)
427-3324 or contact: clones@genomesystems.com or
info@genomesystems.com web site: www.genomesystems.com
Insert Length: 1400 Std Error: 0.00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Contact: Shoemaker R/Public Soybean EST Project Public Soybean EST Project Washington University School of Medicine 4444 Forest Park Parkway, Box 8501, St. Louis, MO 63108,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; MagnolLophyta; eudicotyledons; core eudicots; Rosidae; eurosids I; Fabales; Fabaceae; Papilionoideae; Glycine.

1 (bases 1 to 606)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AW203630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                  High quality sequence stop: 414.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AW203630.1 GI:6502257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PROTEIN ; , mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              314 286 1800
314 286 1810
/note-"Vector: pBluescript II XR; Site_1: EcoRI; Site_2: XhoI; The mRNA was isolated from roots of Glycine max 'Supernod' plants generously donated by Dr. Gary Stacey. The seedlings were innoculated with Bradyrhizobium
                                                                                                      /db_xref="taxon:3847"
/clone="GRNOME SYSTEMS CLONE ID: Gm-c1028-2058"
/clone_lib="Gm-c1028"
/clone_type="roots of 'Supernod' plants"
/lab_host="DH10B"
                                                                                                                                                                                                                                                                                                     Location/Qualifiers
                                                                                                                                                                                                                                                   /organism="Glycine max"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          606 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                17-JUL-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Beck, C.,
```

RESULT :

SOURCE KEYWORDS VERSION ACCESSION DEFINITION LOCUS

EST

AW784884.1 AW784884 AW784884

GI:7841660

115201 MARC 1PIG

506 bp

Sus scrofa cDNA 5', mRNA sequence.

09-JUL-2000

ORGANISM

Sus scrofa

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae;

Euteleostomi; Sus.

밁 QΥ 밁 QΥ 망 Qy Вþ Ωy В 80 Вþ Š

> 477 654 417 594 357

Qγ 밁 δÃ В δÃ 뫄 Qy 밁 Š

밁

```
Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   414 cactactggttctggttgacctcaatgacatacttggtggcgggattcactgcaaagaagt 473
597 TTTGATAAA 605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               534 caatgtacaaatcccagtggaatgtggtggccttggtgggaaagcagtttatatagatac 593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              474 tactgagatcggttggcgtcccaggggttggtaaaactcaactggggattcaactagcaat 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          297 CACTGAAATAGGTGGAGTTCCAGGCATTGGTAAAACACAAATTGGGATTCAACTTGCGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     237 CACTGCTGTTGGTGATCTGGATAACATCCTTGGTGGAGGAATTAAGTGCAAAGAAGT 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity hes 249; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                agagggcagtttcatggttgaacgtgtctaccagattgctgaagggtgtattagggacat 653
                                                            agtcataaa 782
                                                                                                                           TTATTATATCTTAGGAAATATATTCTATTTTCGTGTTTGCAGCTACGCTGAGCACATTGC
                                                                                                                                                                tgagcgtttcctggcggatatctattacttccggatatgcagttacaccgaacaaattgc
                                                                                                                                                                                                                                                       GGCAGAATACAGCCAGCACTTTCATAAAGATTTTCAAGCTTGTGATGTTAAAATGCACCC
                                                                                                                                                                                                                                                                                                            actggagcactttccgcacagccatgagaagtcctcttctgtccaaaaacaattacagcc
                                                                                                                                                                                                                                                                                                                                                                                      AAATGTTCAGATTCCACAAGAATATGGTGGCCTANGTGGGAAGGCAATATACATCGACAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cloned Pfu DNA polymerase, ligated to EcoRI adapters and subsequently phosphorylated. The xhoI salte within the first-strand synthesis primer was then restricted by digestion with xhoI; all xhoI sites in the cDNA would be protected by their hemimethylated status. The cDNA constructs were size-fractionated with a 500bp cutoff, using GibcoBRI Life Technologies' cDNA Size Fractionation column. The column eluent was then ligated into Stratagene's pBluescript II XR Predigested vector (pBluescript II XK(+) that has been digested with EcoRI and XhoI, and phosporylated by Stratagene). Both the white and blue colonies appear to contain recombinant plasmids with cDNA inserts, based on size (n=25). This library was constructed by Tr paul Keim and Tr Virding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  library was constructed by Dr. Paul Keim and Coryell."

a 110 c 149 g 167 t 1 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          japonicus, strain USDA110 priot to harvest. Stratagene's cDNA synthesis Kit (catalog number 200401) was used to synthesize the cDNA. First-strand synthesis was performe with 5-methyl dCTP, hence the ligated cDNA was hemimethylated. A modification of Stratagene's
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                primer [GAGAGAGAGAGAGAGAGAGAGAGACTAGTCTCGAG(T)18V] to anchor the primer at the 5' end of the poly(A) tract. After second-strand synthesis, the CDNA ends were filled in with
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 first-strand synthesis primer was used. An 'anchor' nucleotide (V=A,C, or G) was added to the 3' end of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 177.6; DB 1
Pred. No. 2.9e-36;
0; Mismatches 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 113; Length 606;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Dr. Virginia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                performed
                                                                                                                                                                                                                                                                                                                                                                                         476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     416
                                                                                                                                                                                                                                                       536
                                                                                                                                                                                                                                                                                                                      713
                                                                                                                                  596
                                                                                                                                                                                              773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
```

BASE COUNT

```
Qy
                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
ORIGIN
   REFERENCE
                                                                          KEYWORDS
                                                                                         VERSION
                                                                                                       ACCESSION
                                                                                                                                   DEFINITION
                                                                                                                                                               RESULT 11
BG471853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE
                                              ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                                                          441
                                                                                                                                                                                                                                                      632
                                                                                                                                                                                                                                                                                                                                                                         512
                                                                                                                                                                                                                                                                                                                                                                                                      261
                                                                                                                                                                                                                                                                                                                                                                                                                                  452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             392 atgagctgtcacagaaacacatcactactggttctggtgacctcaatgacatacttggtg 451
                                                                                                                                                                                                                                                                                381 GTGAAGCAGTTTTTATTGATACAGAGGGGAGTTTTATGGTTGATAGAGTAGTAGACCTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                               201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                 ggaaagcagtttatatatagatacagaggcagtttcatggttgaacgtgtctaccagattg 631
                                                                                                                                                                                                                                                                                                                                                                                                   GTGGAGTACCCTTAACCAAAATAACAGAAATTTGTGGTGCACCAGGTGTTGGAAAAACAC 320
                                                                                                                                                                                                                                                                                                                                                                                                                      gcgggattcactgcaaagaagttactgagatcggtggcgtcccaggggttggtaaaactc 511
                                                                                                                                                                                                                        CTACTGCCTGCATTCAGCACCTAC
                                                                                                                                                                                                                                                 ctgaagggtgtattagggacatac 655
                                                                                                                                                                                                                                                                                                                                          AATTATGTATGCAACTGGCAGTAGATGTGCAGATACCAGAATGTTTTGGAGGTGTAGAAG
                                                                                                                                                                                                                                                                                                                                                                  aactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggtggccttggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAGAACATACCCAGAGCTTCATAATTACCTTCTGTTCAGCACTAGATAATATTCTCGGGG 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         163;
                                                                                                    mRNA sequence.
BG471853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PO B
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
1 (bases 1 to 550)
                                            Homo sapiens
                                                                                        BG471853.1 GI:13404128
                                                                                                                                  602513325F1 NIH_MGC_16 Homo sapiens cDNA clone IMAGE:4635918
                                                                                                                                                BG471853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BACKWARD: GTTTTCCCAGTCACGACG
Plate: 45 row: L column: 4
Seq primer: ATTTAGGTGACACTATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Single pass sequencing. Bases v0.980904.e. Vector identified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             USDA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Contact: Smith TPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and Keele,J.W. Design and use of two pooled tissue normalized cDNA libraries for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Stone, R.T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fahrenkrug, S.C., Freking, B.A., Rohrer, G.A., Smith, T.P.L.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FORWARD: AGGAAACAGCTATGACCAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PCR PRimers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      and -minmatch 12 options.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Email: smith@email.marc.usda.gov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DA, ARS, US Meat Animal Research Center Box 166, Clay Center, NE 68933-0166, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (bases 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     discovery in swine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 402 762 4366
402 762 4390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note-"Vector: pCMV SPORT6; Site_1: x
Library made from pooled tissue from
and 30 embryos."
91 c 126 g 124 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /organism="Sus scrofa"
/db_xref="taxon:9823"
/clone_lib="MARC 1PIG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /tissue_type="pooled"
/lab_host="DH10B"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               to 506)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Heaton, M.P., Grosse, W.M., Bennett, G.A., Laegreid, W.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6.9%;
61.7%;
                                                                                                                                              550 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 102.4; DB 120; Length 506;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pred. No. 2.4e-16
                                                                                                                                                                                                                        464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        pCMV SPORT6; Site_1: XbaI; Site_2: XhoI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  called and alt_trimmed with phred
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cross_match with the -minscore
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           day 11, 13, 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Casas, E.,
                                                                                                                                                                                                                                                                                440
                                                                                                                                                                                                                                                                                                                                                                       571
                                                                                                                                  ú
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
               밁
                                                                       밁
                                                                                                 δÃ
                                                                                                                                DЪ
                                                                                                                                                         γ
                                                                                                                                                                                         망
                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                           1049
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      571
                                                                       426
                                                                                                                                366
                                                                                                                                                            929
                                                                                                                                                                                           306
                                                                                                                                                                                                                                                   246
                                                                                                                                                                                                                                                                                809
                                                                                                                                                                                                                                                                                                            186
                                                                                                                                                                                                                                                                                                                                          749
                                                                                                                                                                                                                                                                                                                                                                      126
                                                                                                                                                                                                                                                                                                                                                                                                   689
                                                                                                                                                                                                                                                                                                                                                                                                                                                           631
                                                                                                                                                                                                                                                                                                                                                                                                                                66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     269;
```

```
486 TAATCTTTCATTGGGACCGAAAGCAAAGGTTGGCAACATTGTACAAGTCACC 537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                             tgattctgcactggaatgggaacgaacgatacgcacatcttgataagtctcc 1100
                                                                                                                                                                                                                caaagacatataacttggcagttgtcttgttgaaccaagtcactactaaatttacagaag
                                                                                                                                                                                                                                                                                                                aagatctggcactgaggaccagagtgctaagtggattatcattgaagttaatgaagattg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AATCAGGCCTTGCTTGCTGCATTAGGGGAAAGTGGGGACATGCTGCTACAATACGGC
                                                                                                                                   ggtcatttcaattgactcttgctctaggtgacagctggtcccactcatgcacgaaccggt 1048
                                                                                                                                                                                    CAAATAATCACAGATTAGCTGTAATTTTAACCAATCAGATGACAACAAAGATTGATAAGA
                                                                                                                                                                                                                                                                                ATGACCTGTCTTCGTACTCGGTTATTAAATGGCCTAGCCCAGCAAATGATCAGCCTTG
                                                                                                                                                                                                                                                                                                                                                                              ACTCAAAGGTTCGACTAGTGATAGTGGATGGTATTGCTTTTCCATTTCGTCATGACCTAG
                                                                                                                                                                                                                                                                                                                                                                                                                      ataaagatgtgcgtatagttattattgatagtgttactttccactttcgacaagattttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tatgcagttacaccgaacaaattgcagtcataaactacatggagaagttcctcagagagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCTACTGCCTGCATTCAGCACCTTCAGCTTATAGCAGAAAAACACAAGGGAGAGGAACAC 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gctgaagggtgtattagggacatactggagcactttccgcacagccatgagaagt--cct 688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cttctgtccaaaaacaattacagcctgagcgtttcctggcggatatctattacttccgga 748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGTGAAGCAGTTTTTATTGATACAGAGGGAAGTTTTATGGTTGATAGAGTGGTAGACCTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cDNA Library Preparation: Ling Hong/Rubin Laboratory CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL) DNA Sequencing by: Incyte Genomics, Inc. Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at: image.llnl.gov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NIH-MGC http://mgc.nci.nih.gov/.
National Institutes of Health, Mammalian Gene Collection (MGC)
Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Tissue Procurement: ATCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Contact: Robert Strausberg, Ph.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                High quality sequence stop: 550.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Email: cgapbs-r@mail.nih.gov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LLCM1394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /clone_lib="NIH_MGC_16"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /clone="IMAGE:4635918"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /organism="Homo sapiens"
/db_xref="taxon:9606"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               50.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       row: a column: 07
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 100.4; DB 154; Length 550; Pred. No. 8.1e-16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           261;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       808
                                                                                           485
                                                                                                                                                                                                                                                                                365
                                                                                                                                                                                                                                                                                                                                                                              305
                                                                                                                                                                                                                                                                                                                                                                                                                           868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ۲,
```

```
ACCESSION
VERSION
                              Ωy
                                                                В
                                                                                               Qy
                                                                                                                               рЬ
                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOURCE
ORGANISM
В
                                                                                                                                                                                               Д
                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AI184177/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                 Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AUTHORS
                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
 499
                                                                                                                                619
                                                                                                                                                                 452
                                                                                                                                                                                                 679
                                                                                                                                                                                                                              392 atgagetgteacagaaacacateactactggttetggtgaceteaatgacatacttggtg 451
             ggaaagcagtttatatagatacagagggcagtttcatggttgaacgtgtctaccagattg 631
                                                                                   aactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggtggccttggtg 571
                                                                                                                                                gcgggattcactgcaaagaagttactgagatccggtggcgtcccaggggtttggtaaaactc 511
                                                                                                                                                                                                 AGGAGCATACCCAGGCTTTCATAATCACTTTCTGTTCAGCACTAGATGATATTCTTGGGG 620
 GTGAAGCAGTTTTTATTGATACAGAGGGAAGTTTTATGGTTGATAGAGTGGTAGACCTTG
                                                                  AATTATGTATGCAGTTGGCAGTAGATGTGCAGATACCAGAATGGTTTTGGAGGAGTGGCAG
                                                                                                                                  GTGGAGTGCCCTTAATGAAAACAACAGAAATTTGTGGTGCACCAGGTGTTGGAAAAACAC 560
                                                                                                                                                                                                                                                                 162;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNA Sequencing by: Washington University Genome Sequencing Center Clone distribution: NCI-CGAP clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at: www-bio.llnl.gov/bbrp/image/image.html
Insert Length: 892 Std Error: 0.00
Seq primer: -40UP from Glbco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AI184177 692 bp mRNA EST 10-NOV-1998 qf46e08.x1 Soares_testis_NHT Homo sapiens cDNA clone IMAGE:1753094 3' similar to TR:022144 022144 PUTATIVE DNA REPAIR PROTEIN contains Alu repetitive element;contains element MER22 repetitive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AI184177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Contact: Robert Strausberg, Ph.D.
Email: cgapbs-r@mail.nih.gov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Unpublished (1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCI-CGAP http://www.ncbi.nlm.nih.gov/ncicgap
National Cancer Institute, Cancer Genome Anat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AI184177.1 GI:3734815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cDNA Library Preparation: M. Bento Soares, Ph.D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cDNA Library Arrayed by: Greg Lennon, Ph.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (bases 1 to 692)
                                                                                                                                                                                                                                                                                                                                                                  195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           quality sequence stop: 444.
                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gene Index
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ;, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                             /organism="Homo sapiens"
/db_xref="taxon:9606"
/clone="IMAGE:1753094"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /sex="male"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /lab_host="DH10B"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /clone_lib="Soares_testis_NHT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                                                                                                                                 6.8%;
                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                  Score 99.6;
Pred. No. 1
                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                 .6; DB 17;
1.4e-15;
                                                                                                                                                                                                                                                                 104;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Anatomy Project (CGAP),
                                                                                                                                                                                                                                                                                                Length 692;
                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          M. Fatima Bonaldo
                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT :
BE390908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                   В
                                                                Qy
                                                                                                  В
                                                                                                                                Qy
                                                                                                                                                                    밁
                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                   ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM
                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAL
                                     402
                                                                                                     342
                                                                                                                                    512
                                                                                                                                                                    282
                                                                                                                                                                                                    452
                                                                                                                                                                                                                                     222
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          439 CTACTGCCTGCATTCAGCACCTTCAG 414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       632 ctgaagggtgtattagggacatactg
                                                                                                                                                                                                                                                                                                                                                                                           392 atgagctgtcacagaaacacatcactactggttctggtgacctcaatgacatacttggtg 451
ctgaagggtgtattagggacatactg 657
                                                     GTGAAGCAGTTTTTATTGATACAGAGGGAAGTTTTATGGTTGATAGAGTGGTAGACCTTG
                                                                            ggaaagcagtttatatagatacagagggcagtttcatggttgaacgtgtctaccagattg
                                                                                                                                                            AATTATGTATGCAGTTGGCAGTAGATGTGCAGATACCAGAATGTTTTGGAGGAGTGGCAG
                                                                                                                                                                                                         aactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggtggccttggtg
                                                                                                                                                                                                                                                                 GTGGAGTGCCCTTAATGAAAACAACAGAAATTTGTGGTGCACCAGGTGTTGGAAAAAACAC
                                                                                                                                                                                                                                                                                   gcgggattcactgcaaagaagttactgagatcggtggcgtcccagggggttggtaaaactc 511
                                                                                                                                                                                                                                                                                                                                                                   AGGAGCATACCCAGGGCTTCATAATCACCTTCTGTTCAGCACTAGATGATATTCTTGGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        161;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDNA Library Preparation: Ling Hong/Rubin Laboratory CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL) DNA Sequencing by: Incyte Genomics, Inc. Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.

1. (bases 1 to 658)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BE390908 658 bp
601283055F1 NIH_MGC_44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     High quality sequence stop: 624.
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Email: cgapbs-r@mail.nih.gov
Tissue Procurement: ATCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NIH-MGC http://mgc.nci.nih.gov/.
National Institutes of Health, Mammalian Gene Collection (MGC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BE390908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        http://image.llnl.gov
Plate: LLCM252 row: m column: 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Contact: Robert Strausberg, Ph.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BE390908.1 GI:9336273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             183 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /Clone_lib="NIH_MGC_44"
/tissue_type="endometrium, adenocarcinoma cell line"
/lab_host="DH10B (phage=resistant)"
/note="Organ: uterus; Vector: pOTB7; Site_1: xhoI; Site_2:
ECORI; cDNA made by oligo-dT priming. Directionally
cloned into ECORI/XhoI sites using the following 5'
adaptor: GGCACGAG(G). Library constructed by Ling Hong
in the laboratory of Gerald M. Rubin (University of
California, Berkeley) using ZAP-cDNA synthesis kit
(Stratagene) and Superscript II RT (Life Technologies)."
a 134 c 163 g 178 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /organism="Homo sapiens"
/db_xref="taxon:9606"
/clone="IMAGE:3605172"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 98; DB : Pred. No. 3.6e 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ното
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     sapiens cDNA clone IMAGE:3605172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 167;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 658;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                            631
                                                                                                                                                                                                                                                                                                                                                                      281
                                                                                                                                                               401
                                                                                                                                                                                                              571
                                                                                                                                                                                                                                                                 341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
```

## 462 CTACTGCCTGCATTCAGCACCTTCAG 487

밁

```
RESULT 1
BE407492
                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DEFINITION
                                                                                                                                                 Š
                                                                                                                                                                                                       밁
В
                                        Š
                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 6.6%;
Best Local Similarity 60.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches 161;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        source
503
                                                                                                                                                                                                         383
                                                                                                                                                                                                                                                                                                          323
                                                                                                                                                                                                                                                                                                                                                             452
                                                                                                                                                                                                                                                                                                                                                                                                                263
                                                                                                                                                                                                                                                                                                                                                                                                                                                         392 atgagetgtcacagaaacacatcactactggttctggtgacctcaatgacatacttggtg 451
                                             632 ctgaagggtgtattagggacatactg 657
  CTACTGCCTGCATTCAGCACCTTCAG
                                                                                                   GTGAAGCAGTTTTTATTGATACAGAGGGAAGTTTTATGGTTGATAGAGTGGTAGACCTTG 502
                                                                                                                                                                                                                                    aactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggtggccttggtg 571
                                                                                                                                                                                                                                                                                                                                     gcgggattcactgcaaagaagttactgagatccggtggcgtcccaggggttggtaaaactc 511
                                                                                                                                                                                                                                                                                                                                                                                                           AGGAGCATACCCAGGGCTTCATAATCACCTTCTGTTCAGCACTAGATGATATTCTTGGGG 322
                                                                                                                                                 ggaaagcagtttatatagatacagagggcagtttcatggttgaacgtgtctaccagattg 631
                                                                                                                                                                                                         AATTATGTATGCAGTTGGCAGTAGATGTGCAGATACCAGAATGTTTTGGAGGAGTGGCAG 442
                                                                                                                                                                                                                                                                                                          GTGGAGTGCCCTTAATGAAAACAACAGAAATTTGTGGTGCACCAGGTGTTGGAAAAACAC 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNA Sequencing by: Incyte Genomics, Inc.
Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at: image.llnl.gov plate: LLCM318 row: k column: 06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 (bases 1 to 683)
NIH-MGC http://mgc.nci.nih.gov/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BE407492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BE407492 683 bp mRNA EST 21-JUL-2000 601300322F1 NIH_MGC_21 Homo sapiens cDNA clone IMAGE:3630461 5',
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      High quality sequence stop: 630.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Tissue Procurement: ATCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Email: cgapbs-r@mail.nih.gov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Contact: Robert Strausberg, Ph.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           National Institutes of Health, Mammalian Gene Collection (MGC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BE407492.1 GI:9343942
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cDNA Library Preparation: Ling Hong/Rubin Laboratory CDNA Library Arrayed by: The I.M.A.G.E. Consortium (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        195 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /tissue_type="choriocarcinoma"
/tissue_type="choriocarcinoma"
/lab_host="PHIOB (phage-resistant)"
/lab_host="PHIOB (phage-resistant)"
/note="Organ: placenta; Vector: pOTB7; Site_1: XhoI;
/note="Organ: placenta; Vector: poTB7; Site_1: XhoI;
Site_2: EcoRI; cDNA made by oligo-dT priming.

Directionally cloned into EcoRI/XhoI sites using the
proceed of the control of the control of control of CGCACGAG(G). Size-selected >500bp
for average insert size 1.8kb. Library constructed by
Ling Hong in the laboratory of Gerald M. Rubin (University
of California, Berkeley) using ZAP-cDNA synthesis kit
(Stratagene) and Superscript II RT (Life Technologies)."
a 136 c 170 g 182 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism="Homo sapiens"
/db_xref="taxon:9606"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /clone="IMAGE:3630461"
/clone_lib="NIH_MGC_21"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   rocari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              on/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0; Mismatches 105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 98; DB 167;
Pred. No. 3.7e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 683;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (LLNL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0,:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0,
```

```
COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DEFINITION
                                    Ş
                                                                                 멍
                                                                                                                        Qy
                                                                                                                                                                   밁
                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                            DЪ
                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Locus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BG177028
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            source
                                                                                                                                                                      419
                                                                                                                                                                                                                                                                                                                                                                     392 atgagctgtcacagaaacacatcactactggttctggtgacctcaatgacatacttggtg 451
539
                                                                                                                                                                                                                                                          359
                                                                                                                                                                                                                                                                                                                                              299 AGGAGCATACCCAGGGCTTCATAATCACCTTCTGTTCAGCACTAGATGATATTCTTGGGG 358
                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity 60.5%; hes 161; Conservation
                                                                                                          ggaaagcagtttatatagatacagagggcagtttcatggttgaacgtgtctaccagattg 631
                                                                                                                                                                                          aactggggattcaactagcaatcaatgtacaaatcccagtggaatgtggtggccttggtg 571
                                                                                                                                                                                                                                                          GTGGAGTGCCCTTAATGAAAACAACAGAAATTTGTGGTGCACCAGGTGTTGGAAAAAACAC
                                                                                                                                                                                                                                                                              gcgggattcactgcaaagaagttactgagatcggtggcgtcccaggggttggtaaaactc 511
CTACTGCCTGCATTCAGCACCTTCAG 564
                                  ctgaagggtgtattagggacatactg 657
                                                                                    AATTATGTATGCAGTTGGCAGTAGATGTGCAGATACCAGAATGTTTTGGAGGAGTGGCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cDNA Library Preparation: Life Technologies, Inc.
cDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)
DNA Sequencing by: Incyte Genomics, Inc.
Clone distribution: MGC clone distribution information can
found through the I.M.A.G.E. Consortium/LLNL at:
http://image.llnl.gov
Plate: LLAMI0155 row: h column: 09
High consistent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo. 1 (bases 1 to 778) NIH-MGC http://mgc.nci.nih.gov/. National Institutes of Health, Mammalian Gene Collection (MGC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BG177028 778 bp mRNA 602313836F1 NIH_MGC_85 Homo sapiens cDNA clone IMAGE:4419512 5',
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Plate: LLAM10155 row: h column: 09 High quality sequence stop: 710.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Email: cgapbs-r@mail.nih.gov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Contact: Robert Strausberg, Ph.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BG177028.1 GI:12683731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   uman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  216 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /organism="Homo sapiens"
/db_xref="taxon:9606"
/clone="IMAGE:4419512"
/clone="IMAGE:4419512"
/clone="IMAGE:4419512"
/clone="Ib="NIH_MGC_85"
/tissue_type="lymphoma, cell line"
/lab_host="DH1DB (phage-resistant)"
/lab_host="Dymph" Vector: pcMv-SPORT6; Site_1: NotI;
/note="Organ: lymph; Vector: pcMv-SPORT6; Site_1: NotI;
/site_2: SalI; Cloned unidirectionally; oligo-dT primed.
Average insert size 1.867 kb. Library enriched for
full-length clones and constructed by Life Technologies.
Note: this is a NIH_MGC Library."

16 a 151 c 200 g 211 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 98; DB 174;
Pred. No. 3.8e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 174;
                                                                                                                                                                                                                                                                                                                                                                                                                                         105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 778;
                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                           538
                                                                                                                                                                            478
                                                                                                                                                                                                                                                                 418
```

Job time: 4425 sec

```
Database :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Title:
Perfect score:
                                                                                                                                                                                                                                                                      Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                         Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                       Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                Searched:
SPTREMBL_16:*

1: sp_archea:*
2: sp_bacteria
3: sp_fungi:*
4: sp_human:*
5: sp_inverteb:
6: sp_mammal:*
7: sp_mhc:*
8: sp_organe1:
9: sp_phage:*
10: sp_plant:*
11: sp_rodent:
12: sp_unclass
13: sp_vritebr
14: sp_vrius:**
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              October 1, 2001, 16:27:27; Search time 22.68 Seconds (without alignments) 1715.065 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                           425026 seqs, 132305027 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                            BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-09-537-654-2
1530
1 MGDQSGSRNGPQQKYVSGAQ.....VTGKGIRDAVSSNHKRARVT 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                        sp_archea:*
sp_bacteria:*
sp_fungi:*
sp_human:*
                                                                                 sp_organelle:*
sp_phage:*
                                               sp_plant:*
sp_rodent:*
                                                                                                                                        sp_invertebrate:*
sp_mammal:*
sp_unclassified:*
sp_vertebrate:*
sp_virus:*
                                                                                                                                                                                                                                                                                                                                                                                             425026
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIES

19	18	17	16	15	14	13	12	11	10	9	8	7	6	ر.	4	ω	2	_	No.	1
299	299	299	299.5	302	303.5	309	313	316	318	330.5	345	346	358	395	417	886	1010	1014	Score	
19.5	19.5	19.5	19.6	19.7	19.8	20.2	20.5	20.7	20.8	21.6	22.5	22.6	23.4	25.8	27.3	64.6	66.0	66.3	Query Match Length	
344	344	332	323	341	345	357	340	364	342	236	356	349	315	328	319	332	363	363	ength DB	
10	10	10	1 <sup>1</sup> C	5 C	3	5 C	4 C	5 0	13	5 0	1 0	1 0	2	7	2	10	10	10	1	
Q9M5A2	P93001	Q9LIL0	99НЛ68	086100	29P972	)44246	29UH11	061128	Q9DGC3	Q9NCP0	29V233	074036	Q9UWR5	29Ү8Л4	29YFY1	022144	Q9FT75	Q9FT80	ID	
	P93001 arabidopsis	Q9lil0 arabidopsis	Q9hj68 thermoplasm		. Q9p972 coprinus ci	044246 caenorhabdi	Q9uhll homo sapien	061128 leishmania	Q9dgc3 cynops pyrr	Q9ncp0 giardia lam	Q9v233 pyrococcus	074036 pyrococcus	Q9uwr5 pyrobaculum	Q9y8j4 desulfuroco	Q9yfyl aeropyrum p	022144 arabidopsis	Q9ft75 arabidopsis	Q9ft80 arabidopsis	Description	-

45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20
251.5	254	255.5	260.5	262.5	265.5	268.5	269.5	271.5	273.5	273.5	276.5	280	280	280	280	280.5	282.5	283.5	284.5	290	293.5	294.5	296.5	297.5	298
16.4	16.6	16.7	17.0	17.2	17.4	17.5	17.6	17.7	17.9	17.9	18.1	18.3	18.3	18.3	18.3	18.3	18.5	18.5	18.6	19.0	19.2	19.2	19.4	19.4	19.5
133	132	529	354	133	353	133	347	340	348	344	342	373	341	338	313	353	343	340	337	377	386	331	331	322	369
<b>–</b> 1	_	$\vdash$	ω	Ц	ω	-	ω	10	ω	ω	10	ഗ	ъ	ഗ	Ŋ	۳	w	10	13	σı	_	u	σı	1	1
093756	093758	058001	Q9UUL2	093771	P87210	093762	Q9P956	Q9XED6	P78579	P78613	P94102	Q9U6W1	077135	001679	000847	093747	074569	Q9XED7	Q9W628	061127	Q9HMM4	Q9GRA3	076341	073948	093748
	093758 uncultured		Q9uul2 schizosacch	093771 uncultured	P87210 neurospora	093762 uncultured	Q9p956 penicillium	Q9xed6 zea mays (m	P78579 emericella	P78613 emericella	P94102 arabidopsis	Q9u6wl trypanosoma	077135 drosophila	001679 bombyx mori	000847 trypanosoma	093747 halobacteri	074569 coprinus ci	Q9xed7 zea mays (m	Q9w628 cynops pyrr	061127 leishmania	Q9hmm4 halobacteri	Q9gra3 hydra atten	076341 tetrahymena	073948 methanococc	093748 cenarchaeum

## ALIGNMENTS

DЬ	Qy	Db	Qy	Db	Qy	Db	Qy	Qu Be Ma	Ç K	א מ	3 2	RA	RC	RP	RN	o <b>x</b>	ဂ္ဂ	88	3 8	G N	DE	DT	DŢ	DJ:	A t	ID	RESULT	
255 DYDDLAQRTRVLSEMALKFMKLAKKFSLAVVLLNQVTTKFSEGSFQLALALGDSWSHSCT 314	-	195 HFQANQVQMKPEDILENIFYFRVCSYTEQIALVNHLEKFISENKDVKVVIVDSITFHFRQ 254	125 KSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQ 184	135 GKTQIGIQLSVNVQIPRBCGGLGGKAIYIDTEGSFMVERALQIAEACVEDMEEYTGYMHK 194	65 GKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHE 124	80 NGSRSLINGAKNAWDMLHEEESLPRITTSCSDLDNILGGGISCRDVTEIGGVPGI 134	GPQQKYVSGAQNAWDMFSDELSQKHITTGSG	Query Match 66.3%; Score 1014; DB 10; Length 363; Best Local Similarity 64.7%; Pred. No. 2.3e-76; Matches 187; Conservative 56; Mismatches 40; Indels 6; Gaps	COURT TOWN DOUGHOUSE	AROHENDE 363 AA: ADOLA WE: DOLAROUNERANGEURO DECKA:	tted (OCT-2000) to the		STRAIN=CV. COLUMBIA;	SEQUENCE FROM N.A.	[1]	NCBI_TaxID=3702;	bidopsis.	Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;	Arabidopsis thatiana (Mouse-ear Cress).	RADSIC.	PROTEIN.	(TrEMBLrel. 16, Last annotation	(TrEMBLrel, 16,	2001 (TrEMBLrel.		O9FT80 PRELIMINARY: PRT: 363 AA		

2.

```
RESULT
1D 22144
1D AC 00
DT 00
DT 00
DT 00
DT 00
DT 00
CC 0C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT
QPT75
ID QPT75
AC QQ
AC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q9FT75;
Q1-MAR-2001 (TrEMBLrel. 1
Q1-MAR-2001 (TrEMBLrel. 1
Q1-MAR-2001 (TrEMBLrel. 1
RAD51C PROTEIN.
    STRAIN=CV. COLUMBIA;
Rounsley S.D., Lin X
Sykes S.M., Mason T.
                                                                                                                                                                                                                     Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryophyta;
Magnoliophyta; eudicotyledons; core eud
Brassicales; Brassicaceae; Arabidopsis.
NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                              O22144:
01-JAN-1998 (TrEMBLrel. 05, Created)
01-JAN-1998 (TrEMBLrel. 05, Last sequence of the control of the co
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryohyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  022144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Submitted (OCT-2000) to the EMBL/GenBank/DDBJ EMBL; AJ299424; CAC14091.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Siaud
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN-CV.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q9FT75
                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RAD51C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHE 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SGSRNGPQQKYVSGAQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGV 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NRLILHWNGNERYAHLDKSPSLPVASAPYAVTGKGIRDAVSSNHKRARV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DFEDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDSWSHSCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NGSRS-----LINGAKNAWDMLHEEESLPRITTSCSDLDNILGGGISCRDVTEIGGVPGI 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NRVILYWNGDERYAYIDKSPSLPSASASYTVTSRGLRNS-SSSSKRVKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NRLILHWNGNERYAHLDKSPSLPVASAPYAVTGKGIRDAVSSNHKRARV 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HFQANQVQMKPEDILENIFYFRVCSYTEQIALVNHLEKFISENKDVKVVIVDSITFHFRQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKTQIGIQLSVNVQIPRECGGLGGKAIYIDTEGSFMVKRALQIAEACVEDMEEYTGYMHK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         363 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COLUMBIA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY;
             T.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14091.1; -.
40213 MW; E21D09EC0A79FA7A CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         66.0%; Score 64.4%; Pred.
                                                  Ketchum K.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          16,
16,
16,
             Kerlavage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           57;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Last sequence update)
Last annotation update)
(RAD57).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ed. No. 4.90
Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A.R.,
                                                                                                                                                                                                                                                                                                                          eudicots;
             Crosby M.L., B
R., Adams M.D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          363
                                                                                                                                                                                                                                                                                                                                                               Tracheophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 databases
                                                                                                                                                                                                                                                                                                                               Rosidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                  Brandon
             Somerville
                                                                                                                                                                                                                                                                                                                          Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            363;
                                                            ₽.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6,
                                                            c
             C.R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2;
```

```
RANGE 
                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SQ DR RA
                                                               Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Matc
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                               Interpro; IPR001553; -.
Interpro; IPR003593; -.
PRINTS; PR00142; RECA.
SMART; SM00382; AAA; 1.
SEQUENCE 319 AA; 35320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9YFY1
Q9YFY1;
01-NOV-1999
01-NOV-1999
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Venter J.C.;
Submitted (NOV-1997) to the EMBL/GenBank/DDBJ databases.
EMBL; AC002387; AAB82635.1; ~.
InterPro; IPR001553; ~.
SEQUENCE 332 AA; 36864 MW; A7F058BFD54B8A66 CRC64;
                                                                                                                                                                                                                                                                                                                                                              Kawarabayasi Y., Hino Y., Horikawa H., Yamazaki S., Haikawa Jin-no K., Takahashi M., Sekine M., Baba S.-I., Ankai A., Ku Hosoyama A., Fukui S., Nagai Y., Nishijima K., Nakazawa H., Takamiya M., Masuda S., Funahashi T., Tanaka T., Kudoh Y., Yamazaki J., Kushida N., Oguchi A., Aoki K.-I., Kubota K., Nakamura Y., Nomura N., Sako Y., Kikuchi H.; "Complete genome sequence of an aerobic hyper-thermophilic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-NOY-1999 (TrEMBLrel. 12, Created)
01-NOY-1999 (TrEMBLrel. 12, Last sequence update)
01-MAR-2001 (TrEMBLrel. 16, Last annotation update)
319AA LONG HYPOTHETICAL RADA PROTEIN.
                                                                                                                                                                                                                                                                                                 crenarchaeon, Aeropyrum pernix DNA Res. 6:83-101(1999). EMBL; AP000058; BAA79030.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=99310339; PubMed=10382966;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=56636;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Aeropyrum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Archaea; Crenarchaeota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Aeropyrum pernix.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                19
                     13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      79
                                                                                         Local
                                                                                                                  Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AQNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQ
QKYVSGA------QNAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGV 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YIDKSPSLPSASASYTVTSRGLRNS-SSSSKRVKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFEDLALRTRVLSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERF 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AKNAWDMLHEEESLPRITTSCSDLDNILGGGISCRDVTEIGGVPGIGKTQIGIQLSVNVQ
                                                                    102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
                                                                    Conservative
                                                                                                                                                                                 ; 1.
35320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    64.6%;
66.5%;
                                                                                         27.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Desulfurococcales;
                                                                                                                                                                                      WW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               51;
                                                                    61;
                                                                    Score 417; DE Pred. No. 7.8e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                    <u>~</u>1.
                                                                                                                                                                                      714F88859D619E25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N
                                                                                         DB 1;
1.8e-27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 10;
.9e-74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Desulfurococcaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 39;
                                                                                                               Length
                                                                                                                                                                                      CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             332;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Kosugi
                                                                      34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               <u>ب</u>
                                                                      6
```

밁

56

QKIVDAAREALNIDFKTAYDLKIESMNIKKITTGSRNLDELLGGGIETKTITELFGEFGS

```
Q9UWR5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
Q9Y8J4
                                                                                                        밁
                                                                                                                                      δÃ
                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                    Qy
                                                      RESULT
                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 97
     Q9UWR5
Q9UWR5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-NOV-1999 (TrEMBLrel. 12, Created)
01-NOV-1999 (TrEMBLrel. 12, Last sequence update)
01-MAR-2001 (TrEMBLrel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Submitted (APR-1999) to the EMBL; AF145465; AAD33955.1; InterPro; IPR001553; -. InterPro; IPR003593; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RADA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRINTS; PR00142; RECA. SMART; SM00382; AAA; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=Z533;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=94694;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Desulfurococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Archaea; Crenarchaeota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Desulfurococcus amylolyticus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RECOMBINATION/REPAIR PROTEIN RADA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q9Y8J4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    091814
                                                                                                        312
                                                                                                                                                                                                                                          193
                                                                                                                                                                                                                                                                         155
                                                                                                                                        270
                                                                                                                                                                         252
                                                                                                                                                                                                        212
                                                                                                                                                                                                                                                                                                        153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       125
                                                                                                                                                                                                                                                                                                                                          95
                                                                                                                                                                                                                                                                                                                                                                       93
                                                                                                                                                                                                                                                                                                                                                                                                          35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         65
                                                      σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HSCTNRLILHWN-GNERYAHLDKSPSLPVASAPYAVTGKGIRD
                                                                                                       EVVFVITEEGIRDS
                                                                                                                                                                                                     LAVVLLNQVTTKFTEGSFQLTLALGDS-WSHSCTNRLILHWN-GNERYAHLDKSPSLPVA 269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AVINYMEKFLREHKDVRIVIIDSVTFHFRQDF---EDLALRTRVLSGLSLKLMKIAKTYN
                                                                                                                                      SAPYAVTGKGIRDA 283
                                                                                                                                                                       VAVVVTNQVMARPDVFYGDPTTAVGGHVLAHTPGVRIQLRKSKGNKRIARVVDAPHLPEG
                                                                                                                                                                                                                                      AIVDELFTFVPKN-DVRLVILDSVTSHFRAEYPGREHLAERQQKLNSHLHQLMRLAEAYN
                                                                                                                                                                                                                                                                                                        TEGTFRWERIEAMARAL --
                                                                                                                                                                                                                                                                                                                                      TEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQI
                                                                                                                                                                                                                                                                                                                                                                       ITTGSKSLDELLGGGVETKTITEFFGEYGSGKTQICHQLSVNVQLTPEKGGLNGRAVYID
                                                                                                                                                                                                                                                                                                                                                                                            ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HAPGVRVYLKKSRGNKRIARVVDAPHLPEGETVFAITEWGIRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EFPGRENLAMRQQLLNRHLHQLMRLADIFNVAVVITNQVMARPDVFYGDPTQAVGGHVLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DF - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHE 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----GLDPDEVMKNIYWIRAINSHHQIAIVDKLFTMVK-NDNIKLVVVDSVTSHFRA
                                                                                                                                                                                                                                                                                                                                                                                                                                           97;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDS-WS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                      PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            36434 MW;
                                                                                                        325
                                                                                                                                                                                                                                                                                                                                                                                                                                                         25.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Desulfurococcales; Desulfurococcaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                        50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 395; DB 1; I
Pred. No. 5.4e-25;
0; Mismatches 81;
                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7F30A77DF55FC75E CRC64;
                      315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      328
                                                                                                                                                                                                                                                                                                        ---GLDPDKVMDNIYYMRAYNSDHQI 192
                      A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 328;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     282
                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                          26;
                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                       152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       184
                                                                                                                                                                                                                                                                       211
                                                                                                                                                                                                                                                                                                                                        154
                                                                                                                                                                                                                                                                                                                                                                                                        94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                        251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        162
                                                                                                                                                                                                                                                                                                                                                                                                                                          5
RESULT
O74036
ID 407
AC 07
DT DT 07

                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local (
                                                                                                                                                                                                                                                      074036;
074036;
01-NOV-1998
01-NOV-1998
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    01-MAY-2000
01-MAY-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            J. MO1. EVO1. 0:0-0(1998).
EMBL; AF052597; AAC34998.1;
HSSP; P03017; 2REB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RADA.
                                                                "DNA repair systems common ancestor.";
                                                                                                 STRAIN=DSM 3638;
Diruggiero J., B
                                                                                                                                                                                     Pyrococcus furiosus.
Archaea; Euryarchaeota;
                                                                                                                                                                                                                        RADA.
                                                                                                                                                                                                                                        RECOMBINASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-DSM 4184;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pyrobaculum islandicum.
                                                                                                                                      SEQUENCE FROM
                                                                                                                                                                     NCBI_TaxID=2261;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=2277;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pyrobaculum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Archaea;
   InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              130
                                                                                                                                                                                                                                                                                                                                                                                                        288
                                                                                                                                                                                                                                                                                                                                                                                                                                          255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              21 NAWDMFSDELSQKHITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SALEVYERKKIRKISTGVRALDELLGGGIETRAVTEVAGEFGSGKTQLCHQLAVMVQLA 129
                                                                                                                                                                                                                                                                                                                                                                                                                                        ERYAHLDKSPSLPVASAPYAVTGKGIRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DIYYFRICSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDF---EDLALRTRVLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IRIAKIFDSPYHPEGEVSFRITEEGLVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSF--QLTLALGDSWSHSCTNRLILHWN-GN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NIFYARAYSSDHQMILVDQAKSIIRQH-NVALLIVDSVIAHFRSEFPGRENLAERQQKLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLA 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KHVADLLRLADAYDVAVVITNQVMAQ-PDVFFGNPLRPAGGNILAHGATYRLWLRKSKEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Crenarchaeota;
   IPR000445; -.
                                                                                                                                                                                                                                                    (TrEMBLrel.) (TrEMBLrel.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (TrEMBLrel.
                                                                                                                                  N.A.
                                                                                                     Brown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA;
                                                                                   in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 35118 MW;
                                                                                J.R., Boger
in Archaea:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23.4%;
                                                                                                                                                                                                                                                      08,
16,
                                                                                                                                                                                       Thermococcales; Thermococcaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      13,
13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Thermoproteales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 53;
                                                                                                   Bogert
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Created)
                                                                                                                                                                                                                                                                                       Created)
                                                                                                                                                                                                                                                      Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 358; DB 1;
Pred. No. 6.1e-22;
                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                     Mementos
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3EFD424D8CAB45F8 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                        315
                                                                                                                                                                                                                                                                                                                                                                                                                                          282
                                                                                                                                                                                                                                                                                                                        349
                                                                                                     Robb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Thermoproteaceae;
                                                                                       from
                                                                                                                                                                                                                                                                                                                        Ã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     update)
```

Length 315;

of.

Indels

28;

Gaps

6,

80

254 228 197

287

F.T.; the

last universal

Pyrococcus.

```
QΥ
                                                                    Q
                                                                                               В
                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DR
DR
DR
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 96
                                                                                                                                                 Matches
                                                                                                                                                            Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        InterPro; IPR001553;
InterPro; IPR003593;
SMART; SM00382; AAA;
SEQUENCE 349 AA; 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9V233
Q9V233;
01-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                          01-MAY-2000 (TrEMBLrel. 13, Created) 01-MAY-2000 (TrEMBLrel. 13, Last sequence up 01-MAR-2001 (TrEMBLrel. 16, Last annotation DNA REPAIR PROTEIN RAD51 (RADA).

RADA OR PAB0164.
                                                                                                                                                                                                                                               structure and evolution.";
Submitted (JUL-1999) to the
EMBL; AJ248283; CAB49165.1;
InterPro; IPR001553; -.
InterPro; IPR003593; -.
                                                                                                                                                                                                                        PRINTS; PR00142; RECA. SMART; SM00382; AAA; 1
                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                      STRAIN=ORSAY;
                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                        Archaea; Euryarchaeota; NCBI_TaxID=29292;
                                                                                                                                                                                                                                                                                                                           Heilig R.;
                                                                                                                                                                                                                                                                                                                                                                                                 Pyrococcus abyssi.
                                                                                                                                                                                                                                                                                                              "Pyrococcus abyssi genome sequence: insights into archaeal
 195
                        116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                234
                                                141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 294
                                                                        56
                                                                                                                                                           Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      56
                                                                                               81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              74
                                                                                                                        Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ç
                                                                                                                      SGSRNGPQQKYVSGAQNAWD----MFSDELSQK-----HITTGSGDLNDILGGGIHCKEV
                                                                     TEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDI
                                                                                                AGISEGAALKIIQAARKAANLGTFMRADEYLKKRESIGRISTGSKSLDKLLGGGIETQAI 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYIDTEGSEMVERVYQIAEGCIRDI 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SGSRNGPQQKYYSGAQNAWD----MFSDELSQK-----HITTGSGDLNDILGGGIHCKEV
                       LEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLRE----HKDVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TEGSFQLTLALGDSWSHSCTNRLILH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAVINYMEKFLRE----HKDVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TEVFGEFGSGKTQLAHTLAVMVQLPPEEGGLNGSVIWIDTENTFRPERIREIAQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AGISEGTALKIIQAARKAANLGTFMRADEYLKKRATIGRISTGSKSLDKLLGGGIETQAI 133
                                               TEVFGEFGSGKTQLAHTLAVMVQLPPEEGGLNGSVIWIDTENTFRPERIREIAK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IVIIDSVTFHFRQDF----EDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTK----F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ------NRGLDPDEVLKHIYVARAFNSNHQMLLVQQAEDKIKELLNTDRPVK
                                                                                                                                                Similarity
97; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                             356 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -GHILAHSATLRVYLRKGKGGKRIARLIDAPHLPEGEAVFSITEKGIED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         38399
NRGLDPDEVLKHIYVARAFNSNHQMLLVQQAEDKIKELLNTDKPVK
                                                                                                                                                                                                               39136 MW;
                                                                                                                                                           22.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22.6%;
                                                                                                                                                                                                                                                                                                                                                                                       Thermococcales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               54;
                                                                                                                                              51;
                                                                                                                                                Score 345; DB Pred. No. 8.7e-51; Mismatches
                                                                                                                                                                                                                                                                                     EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 346; DB 1; 1
Pred. No. 7e-21;
4; Mismatches 105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          726E9DF1D67AB039 CRC64;
                                                                                                                                                                                                             96270CE1D64F6CEE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     356
                                                                                                                                                DB 1; L
8.7e-21;
nes 107;
                                                                                                                                                                                                                                                                                                                                                                                      Thermococcaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A
                                                                                                                                                                                                                                                                                                                                                                                                                                                update)
                                                                                                                                                                                                                                                                                                                                                                                                                                     update)
                                                                                                                                                                                                                                                                                     databases
                                                                                                                                                                        Length 356;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                 44;
                                                                                                                                                                                                                                                                                                               chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               44;
                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 349
                                                                        115
                                                                                                                       55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       55
240
                                                194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                187
                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
```

```
Q9DGC3
ID Q
AC Q
DT 0
DT 0
DT 0
OC DT 0
OC C
CC E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULPO
1 OP NOR OF THE STATE
1 OP NOR OF TH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                   RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MO1. Biol. Evol. 17:882-889(2
EMBL; AF198107; AAF74403.1;
InterPro; IPR001553; -.
InterPro; IPR003593; -.
SMART; SM00382; AAA; 1.
NON_TER 1 1
                                                                                                             Q9DGC3;
Q9DGC3;
01-MAR-2001
01-MAR-2001
01-MAR-2001
DMC1.
DMC1.
Cynops pyrrhogaster
Phikarvota; Metazoa;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9NCPO;
01-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Evolution of the eukaryotic translation of release factors.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Diplomonadida; NCBI_TaxID=5741;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Giardia lamblia (Giardia intestinalis)
Eukaryota; Diplomonadida; Hexamitidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNA REPAIR PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q9NCP0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=20293306; PubMed=10833194;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Inagaki Y., Doolittle W.F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                172
                                                                                                                                                                                                                                                                                                                                                                                                                                                          219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local
                                                                                                                                                                                                                                                                                                                                                      10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                      EGEASYSIAAEGIIDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYIDTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ::|:||:| | | | | : | : | | | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | : | | : | : | | : | : | | : | : | | : | : | | : | : | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VVLLNQVTTKFTEGSFQLTL----ALGDSWSHSCTNRLILH-WNGNERYAHLDKSPSLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTFRPEKVAPIAE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SGCADFNALLGGGVETMSITEVFGEFRTGKTQLCHTLAVTAQLPVSKGGGGGKTVYIDTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GDPTRPIG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IVIIDSVTFHFRQDF---EDLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTK----F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VASAPYAVTGKGIRDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VFVTNQVMAQ-VDGAAMFTADPKKPIGGHILAHASTTRLYLRKGRGDTRVAKIYDSPSLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQIAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLMKIAKTYNLA 213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        236 AA;
                                                                                                                                               (TrEMBLrel. (TrEMBLrel. (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence up)
(TrEMBLrel. 16, Last annotation)
                                                                                                                                                                                                                                                                                     PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GHILAHSATLRVYLRKGKGGKRVARLIDAPHLPEGEAVFRITEKGIED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        17:882-889(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RAD51 (FRAGMENT)
                    (Japanese
Chordata;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        25261 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      21.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----RFGLNPKKALDNIMVARVYTHEQQIEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           283
                                                                                                                                               16,
16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              39;
                                                                                                                                               Created)
Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 330.5; DB Pred. No. 8e-20; 9; Mismatches
                    Craniata;
                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CEFA7412568F6D08 CRC64;
                    newt).
ca; Vertebrata;
                                                                                                                                                                                                                                                                                     342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Giardiinae;
                                                                                                                                                                                                                                                                                     ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         termination
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 update)
on update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 5;
                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                       Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         system: origins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                224
```

```
RESULT 11
061128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SO REL
                                                                                                                                                                       밁
                                         밁
                                                                 γQ
             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local S
Matches 90
                                                                                                 Query Match
Best Local S
Matches 90
                                                                                                                                                                     SMART; SM
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Yazawa T., Yamamoto T., Nakayama Y., Hamada S., Abe S.; "Conversion from mitosis to meiosis: morphology and expi and DMC 1 during newt spermatogenesis."; Submitted (APR-2000) to the EMBL/GenBank/DDBJ databases EMBL; AB041944; BAB16892.1; -. SEQUENCE 342 AA; 37981 MW; 868E002AEAF0BEFB CRC64;
                                                                                                                                                                                                                                         McKean P.G., Benson F.E.;
submitted (APR-1998) to the EMBL/GenBank/DDBJ databases.
EMBL; AF062380; AAC16335.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                 01-AUG-1998 (TrEMBLrel.
01-AUG-1998 (TrEMBLrel.
01-MAR-2001 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TISSUE=TESTIS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=8330;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Amphibia; Batrachia; Caudata; Salamandroidea; Salamandridae; Cynops.
                                                                                                                                                                                               HSSP; P03017; 2REB.
InterPro; IPR001553; -.
InterPro; IPR003593; -.
                                                                                                                                                                                                                                                                                    STRAIN-FRIEDLIN;
                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                             Eukaryota; Euglenozoa;
                                                                                                                                                                                                                                                                                                                                                                                     DMC1 HOMOLOG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                           061128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=5664;
                                                                                                                                                                                                                                                                                                                                                         Leishmania major
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                312 LRIAKIYDSPDMPENEATFAITAGGISDA 340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  200
                                           126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29 ELSQK-----HITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVEC 83
              94
                                                                      35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LARLQKISEEYNVAVFVTNQMTADPGAAMSFQADPKKPIGGHILAHASTTRISLRKGRGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGLGGKAYYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIY 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SLKLMKIAKTYNLAVVLLNOVTT-KFTEGSFQLTLAL---GDSWSHSCTNRLILH-WNGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YARAYTSEHQMELLDYVAAKFHEEAGIFKLLVIDSIMALFRVDFSGRGELAERQQKLAQM 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        YFRICSYTEQIAVINYM-EKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGL 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GYTGGKVIFIDTENTFRPDR------LRDIADRFSVDH-------DAVLDNVL 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EYSEKRKMVFHITTGSQEFDKLLGGGIESMAITETFGEFRTGKTQLSHTLCVTAQLPGTD 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ERYAHLDKSPSLPVASAPYAVTGKGIRDA 283
             DTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQ 153
                                         ISTGSTALDQLLGGGGIESRSITEAFGEFRTGKTQIGHTLCVTCQLPLEMGGGNGKAVYV 185
                                                                    ITTGSGDLNDIL-GGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYI 93
90;
                                                                                                                                                                       SM00382; AAA; 1.
CE 364 AA; 39527 MW;
                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRELIMINARY;
 <del>-</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20.8%;
                                                                                                                20.7%;
                                                                                                                                                                                                                                                                                                                                             Kinetoplastida;
                                                                                                                                                                                                                                                                                                                                                                                                   07,
07,
16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     44; Mismatches 101;
                                                                                                  49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 318; DB 13; Pred. No. 1.4e-18;
                                                                                                                                                                                                                                                                                                                                                                                                                             Created)
                                                                                                                                                                                                                                                                                                                                                                                                   Last sequence update)
Last annotation updat
                                                                                                                Score 316; DB 5;
Pred. No. 2.3e-18;
                                                                                                                                                                        A5475644CE8AFBE5 CRC64;
                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                           364
                                                                                                                                                                                                                                                                                                                                             Trypanosomatidae; Leishmania
                                                                                                                                                                                                                                                                                                                                                                                                                                                           AA
                                                                                                                                                                                                                                                                                                                                                                                                   update)
                                                                                                                            Length 364;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 342;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S.;
expression
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        34;
                                                                                                    34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    of
                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PCNA
                                                                                                    8
```

```
RESULT
Q9UH11
ID Q9U
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                              RESULT
044246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QУ
                                                                                                                                                                                                                                                                                                                                                                                 뮵
                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
         DA PA PA
                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Blakey S.;
Submitted (DEC-1999) to 1
EMBL; AL022320; CAB45656
HSSP; P03017; 2REB.
InterPro; IPR001553; -.
044246;
044246;
01-JUN-1998
01-JUN-1998
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             InterPro; IPROUIDO;
InterPro; IPRO03593; -.
SMART; SM00382; AAA; 1.
SMART; SM00382; AAA; 37681 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9UH11 PRELIMINARY; PRT; 340 AA.
Q9UH11:
01-MAY-2000 (TIEMBLIEL. 13, Created)
01-MAY-2000 (TIEMBLIEL. 13, Last sequence update)
01-MAR-2001 (TIEMBLIEL. 16, Last annotation update)
01-MAR-2001 (TIEMBLIEL. 16, Last annotation update)
DJ199H6-1 (DMC1 (DOSAGE SUPPRESSOR OF MCXI, YEAST HOMOLOG) MEIOSIS-
SPECIFIC HOMOLOGOUS RECOMBINATION PROTEIN (LIM15))).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DMC1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=9606;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       144 YFRICSYTEQIAVINYM-EKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         186 DTEGTFRPERIRPIAERFGMD------SNSV-----LDNILVARAYTHEHQ 225
                                                                                                                                                                                                                                                                    307
                                                                                                                                                                                                                                                                                                                                                                                 250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 90 EYSEKRKMVFHITTGSQEFDKLLGGGIESMAITEAFGEFRTGKTQLSHTLCVTAQLPGAG 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29
                                                                                                                                                                               13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NLAVVLLNQVTTKFTEGSFQLTLA-----LGDSWSHSCTNRLILH-WNGNERYAHLDKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE----DLALRTRVLSGLSLKLMKIAKTY
                                                                                                                                                                                                                                                                                                                                                                              :| ||:: ||:|| : ||:| : ||:| : ||:| : ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:| ||:|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIY 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ELSOK-----HITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PSLPELECVYSISEQGIIDAV 363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PSLPVASAPYAVTGKGIRDAV 284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      {\tt NIAVYITNQVVS--DPGGASMFVADPKKPVGGHILAHASTTRLSLRKGRGDQRVCKIFDS}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AHLLSMVAAKMAEDQ-FSLLVVDSITALFRVDFSGRGELAERQQKLAKMLSQLIKIAEEF
                                                                                                                                                                                                                                                                                                                                                                                                                        SLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLAL-----GDSWSHSCTNRLILH-W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YARAYTSEHQMELLDYVAAKFHEEAGIFKLLIIDSIMALFRVDFSGRGELAERQQKLAQM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GYPGGKIIFIDTENTFRPDR-----LRDIADRFNVDH
                                                                                                                                                                                                                                                                    RGELRIAKIYDSPEMPENEATFAITAGGIGDA
                                                                                                                                                                                                                                                                                                                       NGNERYAHLDKSPSLPVASAPYAVTGKGIRDA 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; 88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
   (TrEMBLrel. (TrEMBLrel. (TrEMBLrel.
                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CAB45656.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20.5%; Score 313; DB 4; 32.7%; Pred. No. 3.7e-18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      to the
         16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL/GenBank/DDBJ
         Last sequence update)
Last annotation update)
                                                               Created)
                                                                                                                            PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               040A6E4CF1FEBFA2 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                            357
                                                                                                                                                                                                                                                                          338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 340;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -DAVLDNVL 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          249
                                                                                                                                                                                                                                                                                                                                                                                                                                                    251
                                                                                                                                                                                                                                                                                                                                                                                          306
```

RECA/RAD51/DMC1-LIKE PROTEIN

```
RESULT
Q9P972
             BARARE
                                                                                                                                                      Qy
                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                  밁
                                                                                                                                                                                 망
                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                      Q9P972;
01-OCT-2000 (TrEMBLrel. 15, C)
01-OCT-2000 (TrEMBLrel. 15, L)
01-MAR-2001 (TrEMBLrel. 16, L)
LIM15/DMC1 HOMOLOG PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; AB011382; BAA24982.1; -
EMBL; AF061201; AAD10194.1; -
EMBL; AL023838; CAB61038.1; -
InterPro; IPR000445; -
InterPro; IPR001553; -
InterPro; IPR003583; -
Pfam; PF00633; HHH; 1
SMART; SM00278; HhH1; 1
                                                                      Q9P972
                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=99077299; PubMed=9862483;
Rinaldo C., Ederle S., Rocco V., La Volpe A.;
"The Caenorhabditis elegans RAD51 homolog is transcribed into two
alternative mRNAs potentially encoding proteins of different sizes.";
Mol. Gen. Genet. 260:289-294(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Science 282:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                White
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Higashitani A., Sato
Submitted (FEB-1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Caenorhabditis elegans.
Eukaryota; Metazoa; Nemat.
Rhabditidae; Peloderinae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RAD51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE-99069613;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=CB1392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                   337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        investigating biology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                  277
                                                                                                                                                                                                        212
                                                                                                                                                                                                                                218
                                                                                                                                                                                                                                                        155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Genome sequence of the
                                                                                                                                                         266
                                                                                                                                                                                                                                                                              178
                                                                                                                                                                                                                                                                                                                             118
                                                                                                                                                                                                                                                                                                     95
                                                                                                                                                                                                                                                                                                                                                     35
                                                                                                                                                                                                                                                                                                                                                                           Local Similarity les 87; Conser
                                                                                                                                                                                                     LAVVLLNQVTTKFTEGS--FQLTLAL---GDSWSHSCTNRLILH-WNGNERYAHLDKSPS
                                                                                                                               LPEAEATYSITNHGIEDA
                                                                                                                                                         LPVASAPYAVTGKGIRDA
                                                                                                                                                                              VAVIITNQVVAQVDGGASMFQADAKKPIGGHIIAHMSTTRLYLRKGKGENRVAKMVQSPN
                                                                                                                                                                                                                             ALTIRAGAMMSESR-YAVVIVDCATAHFRNEYTGRGDLAERQMKLSAFLKCLAKLADEYG
                                                                                                                                                                                                                                                    AVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLMKIAKTYN
                                                                                                                                                                                                                                                                             TNATERPERITATAQ ------
                                                                                                                                                                                                                                                                                                   TEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERFLADIYYFRICSYTEQI
                                                                                                                                                                                                                                                                                                                           IRTGSASLDRLLGGGIETGSITEVYGEYRTGKTQLCHSLAVLCQLPIDMGGGEGKCMYID
                                                                                                                                                                                                                                                                                                                                                ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID 94
                                                                                                                                                                                                                                                                                                                                                                                                                                      SM00278;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ഗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OR RDH-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (JUN-1998)
                                                                      PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2012-2018(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                      AA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PubMed=9851916;
                                                                                                                                                                                                                                                                                                                                                                                                                                      39193
                                                                                                                                                                                                                                                                                                                                                                                    20.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Nematoda; Chromadorea; Rhabditida; Rhabditoidea; cinae; Caenorhabditis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ţ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            to;
                                                                                                                                                         283
                                                                                                                                 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      nematode
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the
                                                                                                                                                                                                                                                                                                                                                                                                                                      MW.
                                                                                                                                                                                                                                                                                                                                                                           36;
                    Last sequence update)
Last annotation update)
                                             Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                        Score 309; DB 5;
Pred. No. 8.5e-18;
6; Mismatches 105
                                                                                                                                                                                                                                                                                                                                                                                                                                      ECED8C7021204BED CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C.elegans: A platform
                                                                                                                                                                                                                                                                           -----RYNMDSAHVLENIAVARAYNSEHLM
                                                                      345
                                                                      A
                                                                                                                                                                                                                                                                                                                                                                           105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            databases
                                                                                                                                                                                                                                                                                                                                                                                               Length 357;
                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     for
                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                              336
                                                                                                                                                                                                                             276
                                                                                                                                                                                                                                                                           217
                                                                                                                                                                                                                                                                                                   154
                                                                                                                                                                                                                                                                                                                           177
                                                                                                                                                                                                                                                                                                                                                                        6
```

```
RESULT
001680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ΩY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OCCOCK
OC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cinereus and its expression in pairing.";
Mol. Gen. Genet. 262:781-789()
EMBL; AB036801; BAA89533.1; -
InterPro; IPR001553; -
InterPro; IPR003593; -
PRINTS; PR00142; RECA.
SMART; SM00382; AAA; 1.
                                                                                                                                                                                                                                                                                                                                                               O01680
O01680;
O1-JUL-1997
O1-JUL-1997
O1-MAR-2001
       EMBL; U94994; AAB53331.1; -. HSSP; P03017; ZREB. InterPro; IPR001553: -. TnterPro; IPR001553: -.
                                                                                                                                                                                                                                               Eukaryota; Metazoa; //
Pterygota; Neoptera;
                                                                                                                                 TISSUE=TESTIS;
                                                                                                                                                                                                                            Bombycoidea; Bombycidae;
                                                                                                                                                                                                                                                                                            Bombyx mori (Silk moth)
                                                                                                                                                                                                                                                                                                                                            DMC1 HOMOLOG.
                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                    NCBI_TaxID=7091;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Nara
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sakaguchi K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Nara T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Coprinus cinereus (Inky cap fungus).
Eukaryota; Fungi; Basidiomycota; Hymenomycetes; Agaricales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=20092483; PubMed=10628861;
Nara T., Saka T., Sawado T., Takase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "Isolation of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  148 CSYTEQIAVINYMEKFLREHKDVRIVIIDSVTFHFRQDFE---DLALRTRVLSGLSLKLM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        108 ISTGSKLVDGILGGGVMSQSITEVYGEYRTGKTQLAHTMSVVAQLPPEYGGAAGKVAYID 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        95 TEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQKQLQPERF-----LADIYYFRI 147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AKLVDSPDRPESEASYKLDEGGWAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AHLDKSPSLPVASAPYAVTGKGIRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FNSEHQMELINECSARFAEDKDFRLLIIDSIMALFRVDYSGRGELSERQQKLAQMLSKLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KLSEEFNIAVLMTNQVQSDPGATMTFVAGGALKPIG-GHILSHASATRIFLRKGRAEERV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KIAKTYNLAVVLLNQV-----TTKFTEGSFQLTLALGDSWSHSCTNRLILH-WNGNERY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLGIQLAINVQIPVECGGLGGKAVYID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sakaguchi
IPR003593;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (JAN-2000)
                                                                                                                                                                                                                                            Metazoa; Arthropoda; Tracheata; Hexapo
Neoptera; Endopterygota; Lepidoptera;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    345 AA; 37606 MW;
                                                                                                                                                                                                                                                                                                                                                               (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                          (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Coprinus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   a LIM15/DMC1 homolog
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     262:781-789(1999).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ×
:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19.8%; 32.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6
                                                                                                                                                                                                                                                                                                                                                               04,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                              Bombyx.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   40;
                                                                                                                                                                                                                                                                                                                                                           Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              homolog from in relation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 303.5; 1
Pred. No. 2.3e
10; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AB1C15B796F6F0EB CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Η.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                          341
                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the basidiomycete Coprinus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ιtο
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .3e-17;
                                                                                                                                                                                                                                               Hexapoda; Insect
ptera; Glossata;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meiotic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Hotta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                       Insecta
                                                                                                                                                                                                                                               Ditrysia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     204
```

```
DR SMART; SM00382; AAA; 1.
SQ SEQUENCE 341 AA; 37773 MW; 303D4C9F67427F46 CRC64;
```

망	Qy	Дb	Qy	Db	Qy	Db	Qy	Db	Qy	Que Bes Mat
295 AHASTTRISLRKGRGDNRIAKIYDSPDLPESEATFAITNGGVADA 339	240 SHSCTNRLILH-WNGNERYAHLDKSPSLPVASAPYAVTGKGIRDA 283	238 GELADROOKLAQVISRIQKISEEYNVAVFITNOMTADPGATLTFQADPKKPIGGNIL 294	188 -DLALRTRVLSGLSLKLMKIAKTYNLAVVLLNQVTTKFTEGSFQLTLALGDSW 239	179 -NLDQNAVLDNVLYARAYTSEHQAELLDYVAAKFHEEAGVFKLLIIDSIMALFRVDFSGR 237	131 KQLQPERFLADIYYFRICSYTEQIAVINYM-EKFLREHKDVRIVIIDSVTFHFRQDFE 187	138 HTLCVTTQIPNSKGYQGGKVMFLDTEHTFRPDRLRPIADRF 178	71 IQLAINVQIPVECGGLGGKAVYIDTEGSFMVERVYQIAEGCIRDILEHFPHSHEKSSSVQ 130	79 QKVVTLGEMTALEV-SDRRKQVEKISTGSTELDKLLAGGIESMAITEVFGEFRTGKTQLS 137	13 QKYVS-GAQNAMDMFSDELSQK-HITTGSGDLNDILGGGIHCKEVTEIGGVPGVGKTQLG 70	Query Match 19.7%; Score 302; DB 5; Length 341; Best Local Similarity 32.3%; Pred. No. 3.1e-17; Matches 92; Conservative 49; Mismatches 106; Indels 38; Gaps 10;

Search completed: October 1, 2001, 16:29:07 Job time: 100 sec

•		· -	 	,			
· ·							
•							
			•				
	•						
						•	
		•					
					·		